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MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)
1975 S G GATHMAN, R E LARSON

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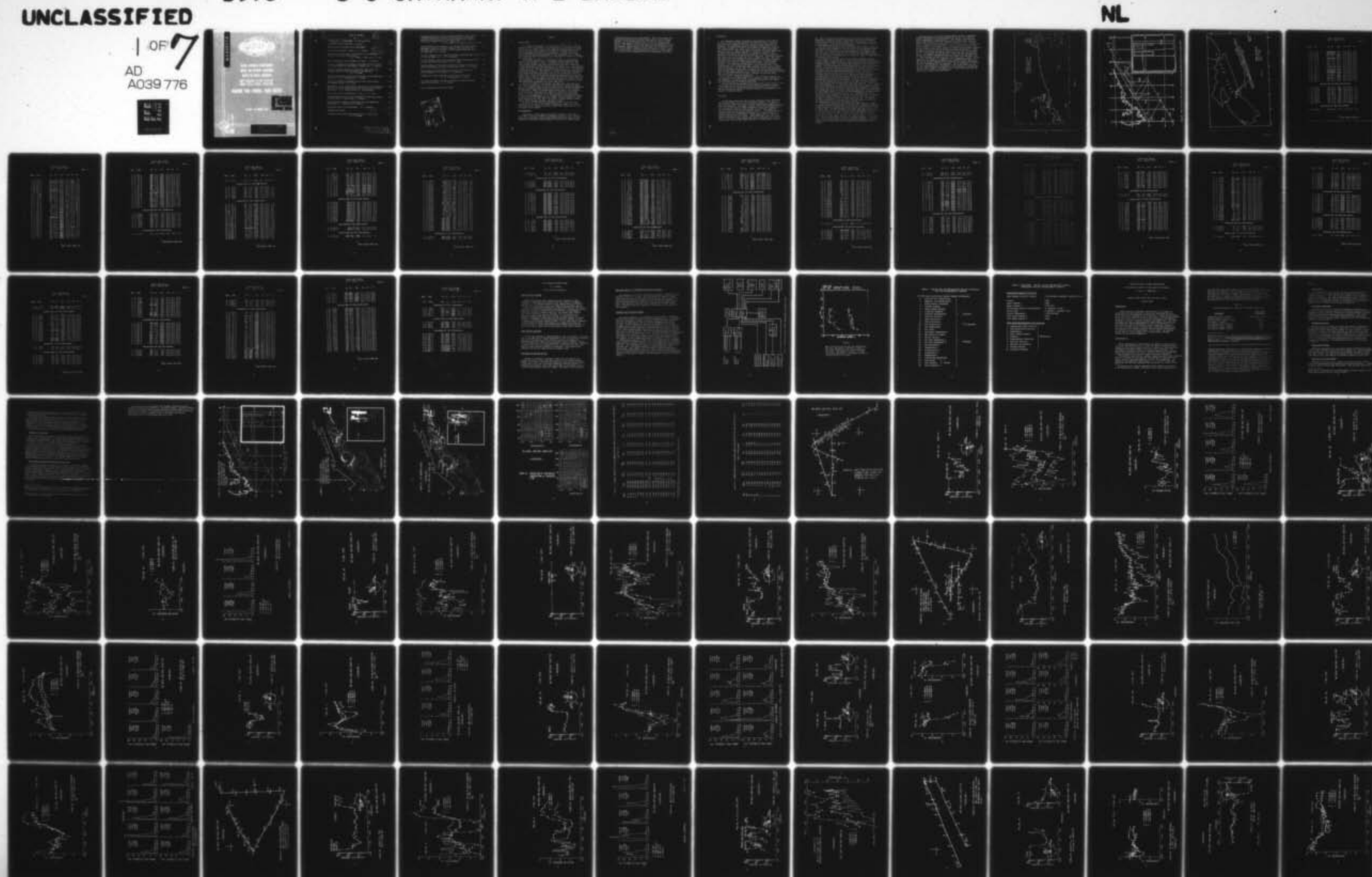

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MARINE FOG CRUISE, USN

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TABLE OF CONTENTS

Marine Fog Cruise, USNS Hayes, 21 July - 28 August, 1975

(6)

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PREFACE

INTRODUCTION

The first

The purpose of this Expedition was twofold. First of all, it was to measure together in one area of high fog incidence a sufficient data base that would be suitable to test various existing boundary layer fog models by providing both input conditions necessary for the model as well as actual measurements of what the model predicts. Secondly, the cruise enabled multidisciplined measurements on other parameters of the boundary layer which may bear an important role in the physics of marine fog formation and dissipation. The present report attempts

Consequently the group of 25 scientists (listed on page 610) were invited to participate in this joint research endeavor aboard the USNS Hayes during the summer of 1975. In addition an instrumented aircraft flown by Ralph Markson made soundings and observations off of the coast of Nova Scotia while the USNS Hayes was in the general area. Each scientist or small group of scientists initiated and carried out his or her individual research projects. The interpretation of these projects are to be reported individually elsewhere. This report is, however, an effort to combine the papers describing the reduced data of all of the investigators into one common place so that the unique multidiscipline approach will not be lost. Certain papers, however, treat such unusual subjects that these authors have written brief texts to accompany their data describing the significance of these parameters. In an effort to reduce the overall length of this report some papers were shortened at the editors discretion.

The cruise (figure 1) was divided into three legs. The first leg of the cruise left Norfolk, Virginia, on the 29th of July 1975, and docked in Halifax, N. S., on 12 August. Most of the fog events occurred during the complicated ~~maneuvers~~ during the ~~first~~ leg which are shown in figure 2 and elsewhere in this report. Many of the investigators disembarked at the conclusion of the first leg. The second leg figure 3, covered much of the same waters as did the first leg, but no major fog events were encountered. A third leg left Halifax, N. S., on 20 August 1975 and crossed the Atlantic as shown in figure 1. The majority of papers ~~in this report~~ discuss only their findings on the first leg of the cruise. Several authors, however, discuss their findings throughout the entire cruise.

An effort has been made to standardize on GMT for the data times presented in this report. The reader is cautioned, however, that this effort was not too successful and that several other time frames are used by several of the authors.

ACKNOWLEDGMENTS

The authors of these papers would like to express our gratitude to a number of people who made this expedition possible. The foundation ideas of a coordinated cruise by Navy research groups and Navy supported researchers from various fields brought to reality by Dr. Lothar Ruhnke

of NRL for which we are all very thankful. Many of the authors were sponsored by the Naval Air Systems Command and the Office of Naval Research. We would particularly like to thank Mr. Murray Schefer and Mr. James Hughes of these offices for their encouragement and support. The authors also wish to thank the ships facility group and the shipboard computer group of NRL for their fine cooperation. We would like to thank the master of the USNS Hayes, Mr. John J. Cullen and first officer Mr. Nick Triantafyllou as well as all the members of the crew for their enthusiastic help in carrying out this cruise.

NAVIGATION

Two independent methods of navigation were employed on this cruise. The ships officers provided standard ship navigation based on Loran A, and a marginally operative radar for occasional checks with shore line landmarks. An experimental automatic navigation system based on real time computer analysis of Loran C coordinates was designed for scientific use on this cruise. When Loran signals are strong, both methods agree reasonably well at points of the Loran A fixes with occasional differences on the interpolation points between. The automatic system has the advantage of providing continuous determinations of position from which ship speed and the course made good can be calculated. Differences occurred when either the Loran A and/or the Loran C signals were weak. The ship's navigation system was dependent on the experience of the bridge personnel and reduced to a matter of dead reckoning when Loran A signals became unusable. Dead reckoning is complicated by currents, wind, and the frequent small course changes necessary to avoid fishing boats in this prime fishing area. On the other hand, although the Loran C has a greater range and accuracy than the Loran A, the receiver would occasionally lock onto the wrong pulse, (unknown to the computer or the overseeing personnel). Most of these jumps appear as obvious discontinuities when the data is plotted and were corrected for after the fact. However, in very weak signal areas, the Loran C system was unreliable.

Thus there are differing opinions as to the true ship's position for some segments of the cruise track. It is doubtful if these differences are very meaningful for the mesoscale measurements described in this report, but it would be better if they did not exist.

Those scientists whose primary data stations were in the vicinity of the ships bridge and who did not use the ship computer extensively tended to rely primarily on the ship's navigation data, whereas, those scientists who were working with the ship's computer tended to rely primarily on the automatic navigation system.

TRUE WIND

The NRL Marine Fog Cruise was the first operation for the USNS Hayes after several months lay up at Port Canaveral, Florida. As a result of the inactivity, some of the ship's secondary systems were inoperative or marginally operative. The syncro repeaters which supply heading information to the scientific computer became inoperative shortly after embarkation. The calculation of the true wind requires inputs of ships speed and heading as well as the relative wind and direction. As heading and course made good can differ considerably from each other because of wind and current effects on the ship itself. These heading data thus had to be manually entered into the computer. During the first leg of the cruise (up to 11 Aug 1975), four relative wind vector instruments were located on the ship. Three at mast height and one on a 4 meter tower on the port

bow. The two ships systems anemometers became inoperative shortly after embarkation, leaving the burden of providing relative wind information on two systems operated by and described by G. Schacher, and J. Russell in this report. In the second and third legs of the cruise the relative wind was measured by a GILL Bi Vane anemometer.

True wind calculations depend on the simultaneously correct values of four variable input parameters. The failure of any one component causes the result to be unaccurate. There are a number of self checks on the data that can be used to check for self consistency. An example being that if the RPM of ship propellers is 175, then from experience we know that the true speed of the ship must be 12 knots $\pm$ 2 knots. A value outside of the error bar is suspect.

Thus computation of true wind involves several variables, each of which is subject to possible errors. The reliability of the true wind as computed by the shipboard computer increases with increasing wind, decreasing difference between course and heading, and constancy of ship speed and heading. The ship heading can be established within a degree, but the ship velocity is dependent upon wind and currents which can add or subtract a few knots, and can be accurately established only if the precise automatic navigation system discussed above was working properly. The ship is a barrier to air motion, the speed and direction of the wind will be distorted while in the vicinity of this barrier, and the measurements will be in error with the extent and nature of the error being somewhat dependent upon the direction and velocity of the wind with respect to the ship and the location of the instruments. The most difficult computations are for calm periods when the true wind is the small difference between two large vectors (ship velocity and relative wind velocity). With all of these dire warnings, it is rewarding to note that when true wind is compared with a well defined surface wind from weather maps, the agreement is good. The true wind is within a few knots and a few tens of degrees, in comparison with weather map data, and does not change the magnitude or directions when the ship changes course. At times the two measurements at the mast and the bow of the ship were different by up to 40°. Sometimes this could be attributed to real changes with altitude (as confirmed by the kite balloon position and heading compared to the ship) while at other times it was probably a consequence of the air paths around the ship. For example, if the ship was moving in a following wind of similar speed, the relative wind measurements would often show large differences.

In the tables that follow the true wind is listed under the columns labeled WD for wind direction and WS for wind speed. When one of the four systems necessary to calculate this vector failed, the results are listed as dollar signs. The mast anemometer was always used when possible. If it were out of order for some reason but the bow anemometer was operational, then the true wind vector was calculated from these data and flaged in the printout with an *. The wind speed is listed as knots. The time column is in the GMT frame. Normally, the clear air data is listed every hour. If the computer detected several 10 minute samplings of visibility being less than 2000 meters, it would conclude that this was a fog event and give the listing of the various meteorological parameters every 10 minutes.

The data tables also contain measured values of dry air temperature, dewpoint temperature, sea surface temperature, as well as visibility. Similar measurements appear elsewhere in this report. These data are taken independently by different techniques and considerable variation between sets of similar data are observed from time to time. There are physical reasons for this divergence. Some of these reasons are dependent on the location of the sensor, (i.e., different altitudes above the sea surface) others on more basic differences between the measurement techniques. An example of this are the sea surface temperature measurements. Insitu probes of sea surface temperature (described in the report by both Mack et. al, and Schacher) are both generally higher than the simultaneously measured sea surface temperature using the infrared data described here.

The visibility instrument used for these data is the MRI Model 1580. These data are subject to a truncation error, Fitzgerald, (1976). The air temperature and dewpoint are measured by a Cambridge System Model 110 S and the sea surface temperature by a Barnes PR T-5 infrared thermometer. The three temperatures are in centigrade. The air temperature is listed in the column labeled AIR, the dewpoint in the column labeled DP, and the sea surface temperature labeled SST. The visibility is labeled VSBY and has units of meters. The dollar signs in this column mean that the visibility is greater than 9999 meters.

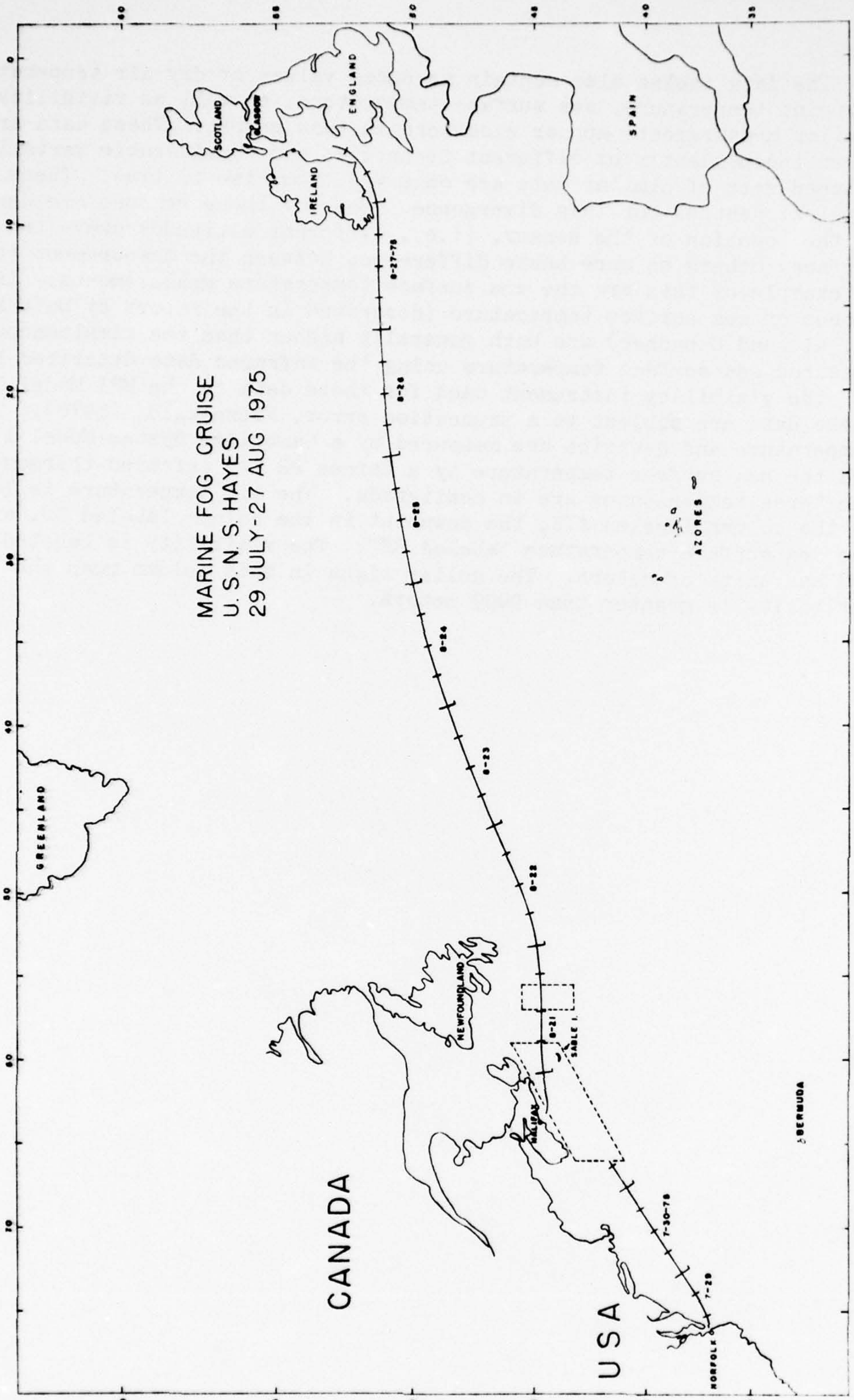

MARINE FOG CRUISE
U.S.N.S HAYES
29 JULY-27 AUG 1975
CANADA
USA
GREENLAND
NEWFOUNDLAND
SCOTLAND
IRELAND
ENGLAND
SPAIN
AZORES
BERMUDA
HALIFAX
NORFOLK
SABLE I.

Fig. 1

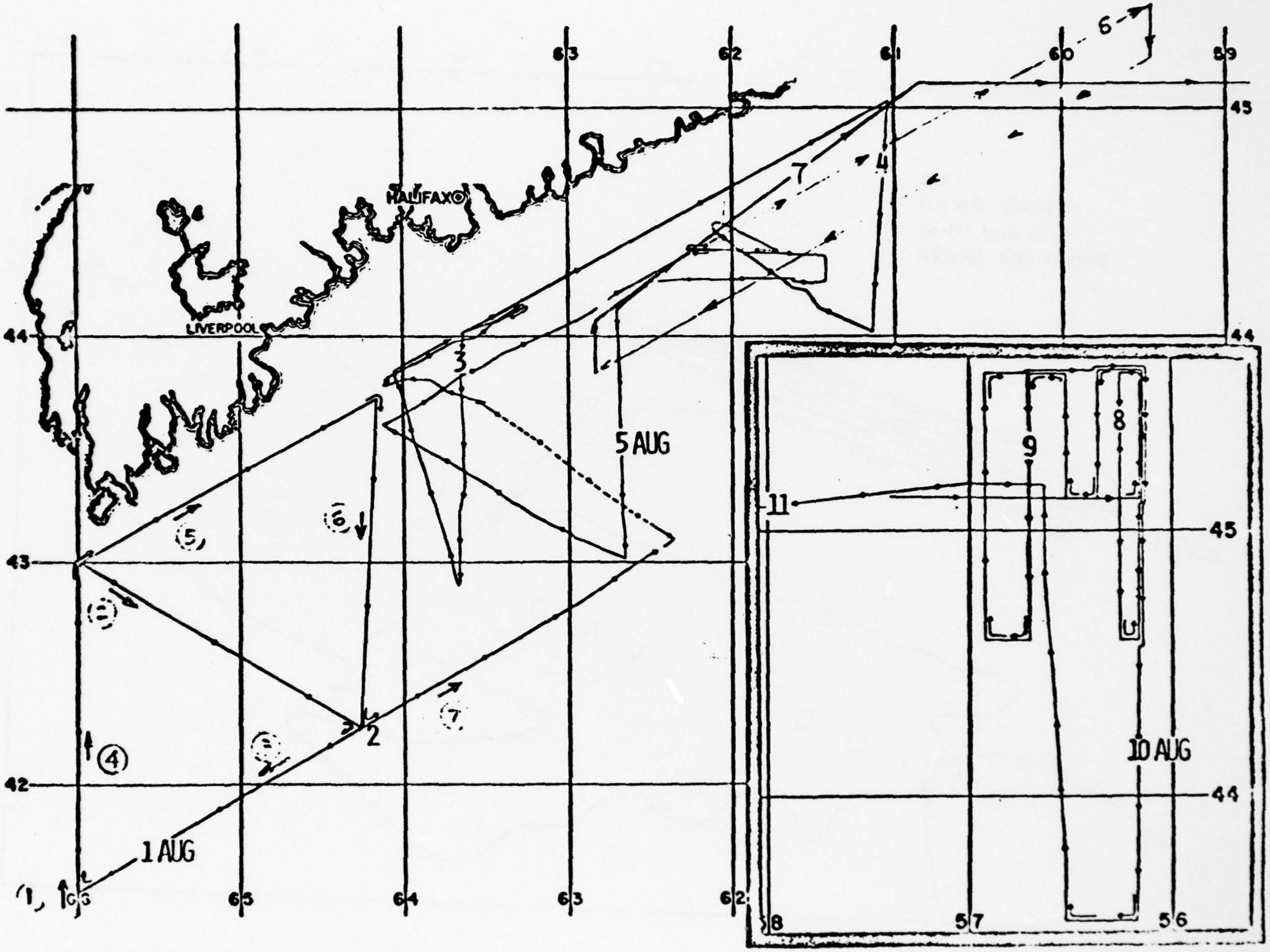
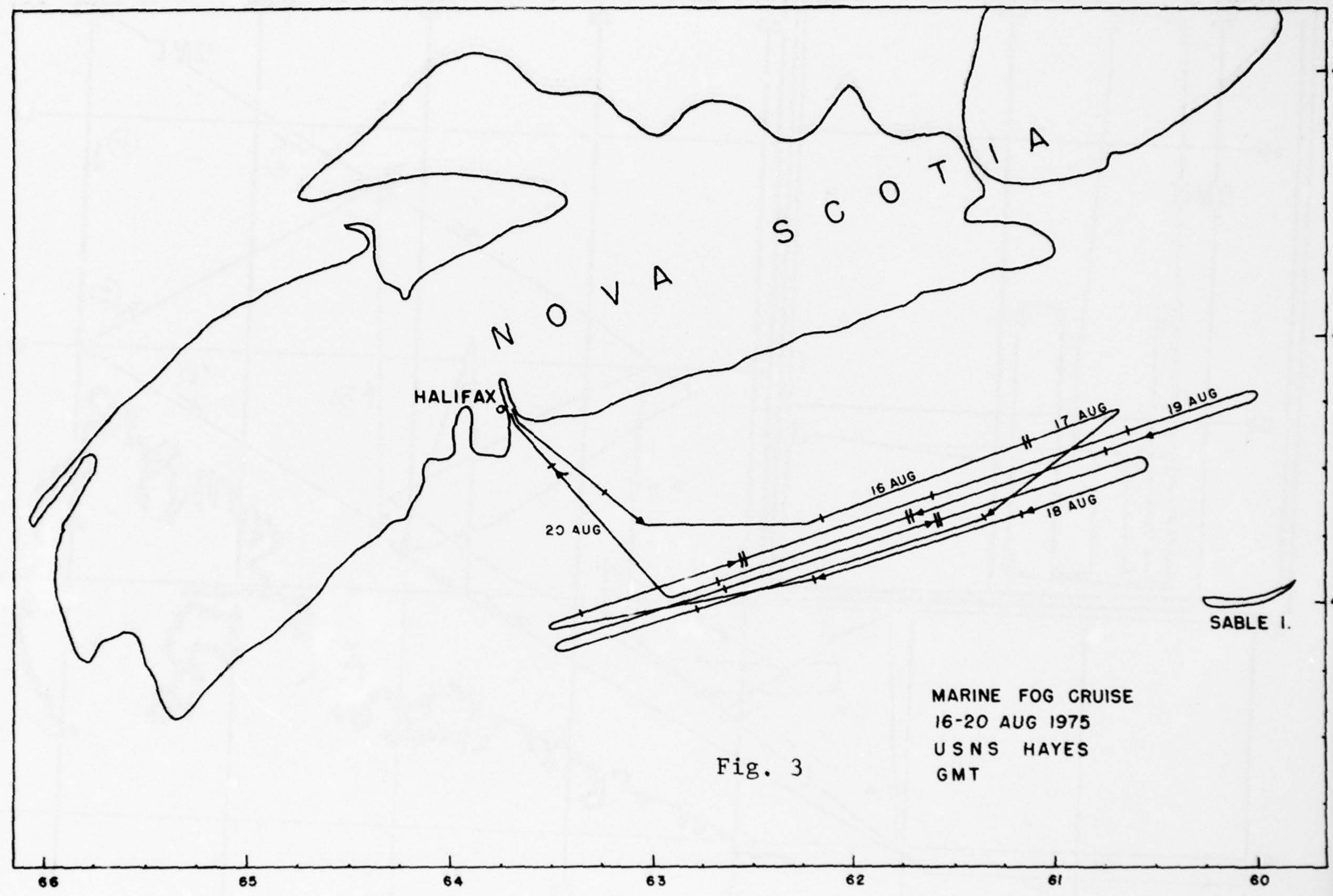


Figure 2 Plot of Track of the U.S.N.S. Hayes During the NRL Marine Fog Cruise in August 1975



NOVA SCOTIA
HALIFAX
16 AUG
17 AUG
18 AUG
19 AUG
20 AUG
SABLE I.
MARINE FOG CRUISE
16-20 AUG 1975
USNS HAYES
GMT
46
45
44
66
65
64
63
62
61
60

Fig. 3

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
7/30	3: 0	$$$◆	$$$$◆	2780	22.6	22.7	21.5
7/30	3:10	$$$◆	$$$$◆	463	22.5	22.5	21.2
7/30	21:50	248	10.6	$$$$	19.8	16.9	15.1
7/30	22: 0	86	3.5	7816	19.6	16.9	15.5
7/31	1:23	$$$◆	$$$$◆	4815	17.6	16.6	11.3
7/31	2: 0	171	2.4	5292	17.8	16.2	11.9
7/31	2:10	205	2.8	436	17.7	16.2	13.1
7/31	3: 0	222	7.9	5372	17.6	16.1	14.5
7/31	4: 0	243◆	8.3◆	9375	18.2	15.5	14.5
7/31	5: 0	223◆	10.8◆	8945	18.0	15.5	13.5
7/31	6: 0	220	6.1	9176	17.1	14.8	12.9
7/31	7: 0	$$$◆	$$$$◆	$$$$	17.8	14.5	13.7
7/31	8: 0	$$$◆	$$$$◆	$$$$	18.2	14.9	13.0
7/31	9: 0	176	11.0	9949	17.8	15.4	13.6
7/31	10: 0	242	28.1	$$$$	18.2	15.2	13.6
7/31	11: 0	238	21.4	$$$$	18.1	16.1	13.9
7/31	12: 0	254	12.0	7276	17.0	15.7	12.6
7/31	13: 0	178	11.1	4037	15.8	14.9	9.7

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
7/31	13:20	234	11.3	1660	15.3	14.7	7.5
7/31	13:30	249	13.9	1150	15.2	14.8	7.4
7/31	13:40	243	17.8	794	15.4	14.9	7.7
7/31	13:50	234	22.4	512	15.0	14.7	7.5
7/31	14: 0	234	22.4	566	14.6	14.0	7.3
7/31	14:10	234	9.5	659	14.0	13.3	7.2
7/31	14:20	164	12.1	1183	14.4	14.0	7.5
7/31	14:30	276	9.4	2045	14.0	13.5	8.1
7/31	14:50	280	9.9	1887	14.3	13.8	8.3
7/31	15: 0	37	16.0	1584	12.9	$$$$	7.8

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
7/31	15:10	254	14.4	2190	13.8	13.3	8.1

◆ DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
7/31	16: 0	272	13.8	6240	13.3	12.8	7.7
7/31	17: 0	$$$◆	$$$$◆	5145	15.6	$$$$	8.6
7/31	18:10	301	12.1	7959	15.6	13.7	9.7
7/31	19: 0	298	11.1	6842	15.9	14.5	10.4
7/31	20: 0	285	14.2	5972	15.4	12.4	10.2
7/31	21: 0	307	12.7	5335	14.9	14.1	10.4
7/31	22: 0	$$$◆	$$$$◆	6220	16.4	14.8	10.9
7/31	23: 0	337	18.0	3442	15.5	14.7	9.2
8/ 1	0:10	335	16.3	4092	16.6	15.7	11.7
8/ 1	0:50	340	13.8	434	17.4	16.2	13.3
8/ 1	1: 0	342	14.5	5571	17.8	16.6	15.8
8/ 1	2: 0	336	11.6	5249	17.7	16.5	14.0
8/ 1	3: 0	350	8.2	6522	19.1	17.3	16.2
8/ 1	4: 0	13	7.7	6903	19.0	16.8	16.0
8/ 1	5: 0	8	9.4	4739	17.1	15.7	12.1
8/ 1	6: 0	38	11.6	4567	16.6	15.3	11.4
8/ 1	7: 0	49◆	11.4	6037	16.7	15.2	12.0
8/ 1	8: 0	69	9.0	$$$$	17.0	13.7	12.7
8/ 1	9: 0	100	6.1	$$$$	17.1	12.0	11.7
8/ 1	10: 0	76	4.2	$$$$	16.4	11.9	11.0
8/ 1	11: 0	79	10.0	$$$$	14.2	10.7	9.5
8/ 1	12: 0	87	13.5	$$$$	14.1	9.6	7.6
8/ 1	13: 0	$$$◆	$$$$◆	$$$$	13.1	10.0	7.3
8/ 1	14: 0	89	7.5	$$$$	13.4	10.7	7.4
8/ 1	15: 0	107	12.3	$$$$	13.7	11.6	8.1
8/ 1	16: 0	130	11.7	$$$$	13.7	11.4	7.5
8/ 1	17: 0	137	11.1	$$$$	13.6	11.8	8.7
8/ 1	18: 0	239	12.3	$$$$	13.9	11.8	10.4
8/ 1	19: 0	197	10.3	$$$$	12.3	$$$$	8.9
8/ 1	20: 0	192	13.2	$$$$	13.3	11.0	9.3
8/ 1	21: 0	220	11.7	9330	13.5	12.0	7.8
8/ 1	22: 0	358	12.0	$$$$	14.5	12.7	10.6
8/ 1	23: 0	218	8.5	$$$$	14.5	12.5	10.9
8/ 2	0: 0	218	12.8	$$$$	13.9	12.2	10.1
8/ 2	1: 0	242	9.4	$$$$	14.0	12.1	10.7

◆ DATA TAKEN FROM BOW

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 2	2: 0	358	11.7	$$$$	14.7	12.5	10.5
8/ 2	3: 0	256	6.5	$$$$	16.0	13.1	13.9
8/ 2	4: 0	290	14.6	$$$$	16.0	13.6	14.2
8/ 2	5: 0	144	6.4	$$$$	16.6	14.3	14.1
8/ 2	6: 0	142	1.9	$$$$	16.5	13.9	13.8
8/ 2	7: 0	97	1.5	$$$$	15.2	12.6	11.7
8/ 2	8: 0	162	2.4	$$$$	15.5	12.9	13.5
8/ 2	9: 0	145	6.4	$$$$	16.7	14.0	14.2
8/ 2	10: 0	142	2.5	$$$$	17.2	14.1	14.8
8/ 2	11: 0	135◆	1.3◆	$$$$	16.3	14.7	13.1
8/ 2	12: 0	114◆	1.8◆	$$$$	16.5	14.3	14.2
8/ 2	13: 0	$$$	$$$$	$$$$	16.5	14.2	14.1
8/ 2	16:20	195	7.4	$$$$	15.0	13.0	10.5
8/ 2	17: 0	240	7.4	$$$$	13.9	12.1	10.0
8/ 2	18: 0	$$$	11.0	9898	15.3	13.2	7.6
8/ 2	19: 0	$$$	11.6	8744	14.6	13.0	9.2
8/ 2	20: 0	174	9.0	8041	14.3	13.5	8.9
8/ 2	21: 0	190	5.3	$$$$	14.6	13.6	10.6
8/ 2	22: 0	158	11.1	8108	14.6	13.9	9.5
8/ 2	23: 0	156	12.6	6404	13.8	12.9	8.4

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

8/ 2	23:30	154	13.7	581	13.3	12.8	8.6
8/ 2	23:40	158	12.0	1379	13.0	12.8	8.3
8/ 2	23:50	164	8.9	741	13.1	12.9	8.0
8/ 3	0: 0	163	9.8	670	13.2	12.9	7.9
8/ 3	0:10	156	7.6	203	13.1	12.9	8.5
8/ 3	0:20	172	8.0	417	13.7	13.6	7.9
8/ 3	0:30	196	6.7	930	14.2	14.2	7.3
8/ 3	0:40	214	5.7	2006	14.4	14.5	8.3
8/ 3	1: 0	176	6.3	1254	14.4	14.2	7.9

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

8/ 3	1:10	141	6.0	3916	14.3	14.2	8.5

◆ DATA TAKEN FROM BOW

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 3	2: 0	122	6.7	5172	14.7	14.3	10.9
******START OF FOG EVENT******							
8/ 3	2:50	139	7.4	1372	14.6	14.4	8.3
8/ 3	3: 0	137	6.5	948	14.3	14.1	6.8
8/ 3	3:10	139	8.8	407	14.3	14.0	8.2
8/ 3	3:20	154	14.1	1014	14.7	14.8	8.4
8/ 3	3:30	151	10.6	795	13.9	13.7	8.4
8/ 3	3:40	130	6.6	840	13.9	13.7	8.2
8/ 3	3:50	138	9.7	853	13.9	13.8	8.1
******END OF FOG EVENT******							
8/ 3	4: 0	130	9.1	2626	14.4	14.3	7.4
8/ 3	5: 0	128	5.9	4643	15.0	14.8	8.4
8/ 3	6: 0	71	8.6	968	14.7	14.5	8.1
8/ 3	6:10	62	8.2	3150	14.6	14.4	8.7
8/ 3	7: 0	58	8.2	4699	14.9	14.9	8.4
8/ 3	8: 0	135	6.6	6200	14.9	14.2	9.7
8/ 3	9: 0	93	18.2	6511	14.4	13.7	10.2
8/ 3	10: 0	96	21.0	6468	14.0	13.5	8.9
8/ 3	11: 0	93	16.7	7847	14.7	13.9	11.5
8/ 3	12: 0	92	14.7	8784	13.5	12.5	7.1
8/ 3	13: 0	349	11.2	7078	12.0	11.3	8.0
8/ 3	14: 0	63	8.5	5628	13.1	12.8	8.9
8/ 3	15: 0	76	10.5	2515	13.9	13.4	9.9
8/ 3	15:20	58	9.0	1673	14.1	13.7	8.5
8/ 3	16: 0	$$$*	$$$$*	5812	14.4	13.9	10.8
8/ 3	17: 0	75	12.7	5032	14.3	13.9	11.4
8/ 3	18: 0	71	14.1	9308	14.7	13.9	11.6
8/ 3	19: 0	66	13.4	8784	14.6	13.6	11.5
8/ 3	20: 0	62	14.2	3365	14.1	13.6	10.3
8/ 3	21: 0	75	15.9	2304	13.8	13.4	10.3
8/ 3	21:10	76	15.0	1711	13.5	13.1	9.1

* DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 3	22: 0	63	9.7	2495	14.2	14.0	9.7
8/ 3	23: 0	244	4.0	3943	14.3	14.0	9.9
8/ 3	23:40	69	13.2	1927	14.3	14.0	10.2
8/ 3	23:50	76	14.2	1801	14.3	14.1	10.1
8/ 4	0: 0	80	15.2	2141	14.5	14.4	9.8
8/ 4	1: 0	80	18.1	4348	15.1	15.0	11.1
8/ 4	2: 0	46	17.0	5179	15.3	15.2	11.2
8/ 4	3: 2	$$$	$$$$	6489	$$$$	$$$$	11.3
8/ 4	6: 4	33	20.9◆	8945	$$$$	$$$$	11.5
8/ 4	7: 0	48◆	17.6◆	6866	$$$$	$$$$	11.6
8/ 4	8:10	$$$◆	$$$$◆	9133	$$$$	$$$$	11.6
8/ 4	9: 6	$$$◆	$$$$◆	8744	$$$$	$$$$	11.7
8/ 4	9:40	147	12.1	592	15.4	15.3	11.6
8/ 4	10: 0	74	19.8◆	4462	15.8	15.8	12.3

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	10:50	58◆	15.2◆	513	14.8	14.4	9.9
8/ 4	11: 0	27◆	11.0◆	389	13.8	13.4	9.5
8/ 4	11:10	47◆	13.9◆	363	13.4	13.1	8.9
8/ 4	11:20	51◆	13.9◆	472	13.2	12.9	9.2
8/ 4	11:30	59◆	14.1◆	522	12.7	12.5	8.4
8/ 4	11:40	59◆	15.1◆	506	12.4	12.2	8.2
8/ 4	11:50	56◆	18.3◆	694	12.7	12.6	8.8
8/ 4	12: 0	53◆	17.6◆	994	13.0	13.0	9.0
8/ 4	12:10	57◆	17.1◆	702	13.3	13.3	9.9
8/ 4	12:20	51◆	15.8◆	807	13.4	13.3	10.0
8/ 4	12:30	41◆	16.7◆	800	13.3	13.2	10.1
8/ 4	12:40	$$$	$$$$	1033	13.4	13.2	10.6

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	12:50	4◆	11.8◆	2037	13.3	13.2	10.4
8/ 4	13: 0	18◆	15.9	2531	13.2	13.2	10.3

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	13:40	$$$	$$$$	$$$$	13.2	13.1	7.9

◆
DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	13:50	26◆	14.6◆	1594	13.3	13.1	7.6
8/ 4	14: 0	45◆	15.1◆	776	13.5	$$$$	7.5
8/ 4	14:10	5◆	13.1◆	977	13.1	13.1	7.4
8/ 4	14:20	353◆	15.4◆	869	12.7	36.9	7.3
8/ 4	14:30	1◆	13.7◆	$$$$	12.9	12.9	7.4
8/ 4	14:40	23◆	14.5◆	816	12.4	44.1	8.2
8/ 4	14:50	28◆	14.7◆	845	12.9	12.7	8.3
8/ 4	15: 0	49◆	17.1◆	800	13.3	11.1	9.3
8/ 4	15:10	45◆	13.1◆	1018	13.5	13.2	10.3
8/ 4	15:20	33◆	17.7◆	838	13.6	13.4	10.0
8/ 4	15:30	29◆	13.5◆	642	13.7	13.5	9.9
8/ 4	15:40	30◆	16.5◆	620	13.7	13.4	10.1
8/ 4	15:50	29◆	18.3◆	2112	14.0	13.7	9.9
8/ 4	16: 0	$$$	$$$$	$$$$	14.0	13.7	10.0
8/ 4	16:10	20◆	15.4◆	1709	14.0	13.7	9.9
8/ 4	16:20	2◆	13.5◆	1672	13.7	13.5	10.0
8/ 4	16:30	18◆	14.9◆	1816	13.7	13.6	9.7
8/ 4	16:40	22◆	15.0◆	1554	13.7	13.5	9.8
8/ 4	16:50	57◆	12.9◆	729	13.6	13.4	9.9
8/ 4	17: 0	130	13.3◆	783	13.4	13.2	9.9
8/ 4	17:10	20	13.4◆	728	13.2	13.0	9.3
8/ 4	17:20	0	14.0◆	708	13.1	12.9	8.4
8/ 4	17:30	$$$	$$$$	640	12.9	12.8	8.2
8/ 4	17:40	$$$	$$$$	562	12.6	12.6	7.9
8/ 4	17:50	$$$	$$$$	576	12.8	12.9	7.8
8/ 4	18: 0	$$$	$$$$	584	12.8	12.8	8.3
8/ 4	18:10	$$$	$$$$	477	12.9	12.9	9.2
8/ 4	18:20	$$$	$$$$	608	13.3	13.3	9.7
8/ 4	18:30	$$$	$$$$	515	13.5	13.6	9.9
8/ 4	18:40	$$$	$$$$	1574	14.0	14.0	11.0

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

8/ 4	18:50	$$$	$$$$	4092	15.0	15.2	11.9
8/ 4	19: 0	$$$	$$$$	6341	15.1	47.4	12.4

◆ DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	20: 0	87	9.6	$$$$	15.5	15.4	12.6
8/ 4	21: 0	83	13.3	3732	15.1	15.1	12.4

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	21:10	$$$	$$$$	1619	14.6	14.4	12.2
8/ 4	21:20	$$$	$$$$	1356	14.1	14.0	11.4
8/ 4	21:30	$$$	$$$$	1245	13.7	13.5	10.3
8/ 4	21:40	$$$	$$$$	1245	13.6	13.5	10.0

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 4	22: 0	$$$	$$$$	4556	12.8	12.6	9.3
8/ 4	23: 0	$$$	$$$$	902	13.0	13.0	10.3
8/ 4	23:10	$$$	$$$$	1509	13.4	13.4	9.6
8/ 4	23:20	$$$	$$$$	1437	13.3	13.3	9.7
8/ 4	23:30	$$$	$$$$	6200	13.5	13.6	10.1
8/ 5	0: 0	$$$	$$$$	8904	13.9	13.9	11.5
8/ 5	1: 0	$$$	$$$$	9898	14.5	14.3	10.8
8/ 5	1:20	$$$	$$$$	517	14.4	14.2	10.8
8/ 5	2: 0	$$$	$$$$	8142	14.2	14.0	9.1
8/ 5	4:10	$$$	$$$$	5058	13.5	13.4	11.4
8/ 5	5: 0	$$$	$$$$	3210	14.1	14.2	11.9
8/ 5	6: 0	$$$	$$$$	3495	14.4	14.5	12.5
8/ 5	7: 0	$$$	$$$$	5669	14.4	14.7	12.5

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 5	7:40	$$$	$$$$	629	15.2	15.0	13.1
8/ 5	7:50	$$$	$$$$	408	15.1	14.8	13.1
8/ 5	8: 0	$$$	$$$$	470	14.8	14.3	12.8
8/ 5	8:10	$$$	$$$$	392	14.1	13.6	12.2
8/ 5	8:20	$$$	$$$$	342	13.4	12.9	9.4
8/ 5	8:30	$$$	$$$$	287	13.1	12.7	8.7
8/ 5	8:40	$$$	$$$$	264	12.9	12.7	8.5

◆
DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 5	8:50	$$$	$$$$	351	12.9	12.7	7.8
8/ 5	9: 0	$$$	$$$$	353	13.0	12.8	7.7
8/ 5	9:10	$$$	$$$$	331	13.1	13.0	8.1
8/ 5	9:20	$$$	$$$$	236	13.3	13.2	8.5
8/ 5	9:30	$$$	$$$$	325	13.4	13.3	8.5
8/ 5	9:40	$$$	$$$$	408	13.5	13.4	10.7
8/ 5	9:50	$$$	$$$$	365	13.6	13.5	10.6
8/ 5	10: 0	$$$	$$$$	512	13.6	13.5	11.7
8/ 5	10:10	$$$	$$$$	463	13.7	13.6	10.8
8/ 5	10:20	$$$	$$$$	493	13.8	13.7	10.5
8/ 5	10:30	$$$	$$$$	427	13.5	13.4	10.5
8/ 5	10:40	$$$	$$$$	335	12.9	12.6	9.9
8/ 5	10:50	$$$	$$$$	212	12.9	12.9	8.5
8/ 5	11: 0	$$$	$$$$	135	12.6	12.4	9.4
8/ 5	11:10	$$$	$$$$	315	12.9	12.7	8.8
8/ 5	11:20	$$$	$$$$	561	12.7	12.7	8.4
8/ 5	11:30	$$$	$$$$	627	12.6	12.6	8.3
8/ 5	11:40	$$$	$$$$	1502	12.5	12.3	7.9
8/ 5	11:50	$$$	$$$$	3439	12.9	12.7	8.0
8/ 5	12: 0	$$$	$$$$	3888	13.7	13.4	7.8
8/ 5	12:20	$$$	$$$$	664	14.0	13.8	8.3
8/ 5	12:30	$$$	$$$$	612	13.8	13.6	8.6
8/ 5	13: 0	$$$	$$$$	3873	15.5	7.1	8.7
8/ 5	13:10	$$$	$$$$	523	14.1	14.0	7.6
8/ 5	13:50	280◆	8.4◆	176	13.9	13.7	8.8
8/ 5	14: 0	301◆	9.8◆	428	14.8	14.5	8.5
8/ 5	14:10	311◆	10.2◆	1861	15.5	15.8	7.9

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 5	14:20	299◆	8.8◆	3585	15.6	15.6	8.4
8/ 5	15: 0	295	7.0	5882	15.1	14.8	9.9
8/ 5	16: 0	277	11.4	7769	15.7	15.1	10.3
8/ 5	17: 0	260	12.2	7345	15.5	14.8	10.8
8/ 5	18: 0	$$$◆	$$$$◆	9466	18.3	15.4	9.4

◆ DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 5	19: 0	268	8.9	9112	$$$$	$$$$	8.5
8/ 5	20: 0	285◆	11.7◆	8497	$$$$	$$$$	10.0
8/ 5	21: 0	274	11.4	8744	16.2	14.5	9.0
8/ 5	22: 0	273	10.6	7800	15.3	14.0	10.1
8/ 5	23: 0	246	6.3	9924	16.5	15.1	12.9
8/ 6	0: 0	244	4.0	$$$$	16.6	15.5	12.7
8/ 6	1: 0	300	10.0	$$$$	17.3	16.0	13.1
8/ 6	2: 0	28	1.6	$$$$	16.6	15.9	12.6
8/ 6	3: 0	302	3.5	9353	16.8	16.0	12.3
8/ 6	4: 0	5	5.6	9535	16.1	15.9	12.5

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 6	4:30	355	10.3	860	16.2	16.2	12.7
8/ 6	4:40	4	9.4	592	16.2	16.2	12.7
8/ 6	4:50	5	10.2	527	16.1	16.2	12.5
8/ 6	5: 0	1	10.4	635	16.1	16.2	12.3
8/ 6	5:10	5	11.2	673	16.1	16.2	12.2
8/ 6	5:20	9	12.1	1216	16.1	16.3	12.5
8/ 6	5:30	15	9.5	863	16.2	16.4	12.3
8/ 6	5:40	22	8.5	3258	16.2	16.4	12.2
8/ 6	5:50	17	12.4	1432	16.1	16.3	12.5
8/ 6	6: 0	167	15.1	2022	15.8	16.2	12.3
8/ 6	6:20	26	15.8	1146	15.7	16.2	12.4
8/ 6	6:30	23	10.1	1091	15.7	16.2	12.1
8/ 6	6:40	44	10.4	767	15.7	16.1	12.0
8/ 6	6:50	351	10.7	514	15.6	16.1	12.1
8/ 6	7: 0	22	9.1	510	15.7	16.1	12.1
8/ 6	7:10	353	13.3	527	15.9	16.2	12.5
8/ 6	7:20	353	12.3	504	16.0	16.3	12.5
8/ 6	7:30	4	15.0	629	16.1	16.3	12.4
8/ 6	7:40	1	13.0	489	16.1	16.2	12.3
8/ 6	7:50	343	13.5	442	16.1	16.2	12.6
8/ 6	8: 0	340	13.6	490	16.2	16.2	12.2
8/ 6	8:10	347	14.0	509	16.3	16.3	12.6

◆ DATA TAKEN FROM BOW

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 6	8:20	346	13.9	393	16.2	16.2	12.7
8/ 6	8:30	341	12.0	359	16.0	16.1	12.6
8/ 6	8:40	343	9.9	348	15.9	16.0	12.5
8/ 6	8:50	330	14.1	606	16.0	16.0	12.2
8/ 6	9: 0	330	11.3	590	15.9	15.9	12.2
8/ 6	9:10	357	10.8	583	15.9	15.9	12.3
8/ 6	9:20	357	8.7	1325	16.0	16.0	12.0
8/ 6	9:30	12	11.2	711	15.8	15.9	12.3
8/ 6	9:40	10	12.5	821	15.9	16.0	12.1
8/ 6	9:50	8	11.6	691	16.0	16.0	11.7
8/ 6	10: 0	320	14.9	551	15.7	15.6	11.7
8/ 6	10:10	337	13.3	368	15.8	15.8	11.8
8/ 6	10:20	343	12.7	393	15.9	15.8	11.6
8/ 6	10:30	345	13.1	446	16.0	16.0	11.8
8/ 6	10:40	350	11.2	544	15.8	15.8	11.7
8/ 6	10:50	353	9.3	528	15.9	15.8	11.6
8/ 6	11: 0	342	11.3	664	16.1	16.1	11.5
8/ 6	11:10	350	11.2	878	16.3	16.3	12.1
8/ 6	11:20	340	8.0	992	16.3	16.3	12.5
8/ 6	11:30	350	9.7	466	16.5	16.5	12.8
8/ 6	11:40	351	10.0	767	16.8	16.7	13.1
8/ 6	11:50	360	11.6	917	16.9	16.8	12.8
******END OF FOG EVENT******							
8/ 6	12: 0	13	11.1	5900	17.1	16.8	12.6
******START OF FOG EVENT******							
8/ 6	13: 0	$$$*$$$$*		547	19.5	7.7	12.6
8/ 6	13:10	330	8.5	485	16.9	16.5	13.1
8/ 6	13:20	330	10.8	508	17.0	16.6	13.2
8/ 6	13:30	342	10.9	665	17.3	17.0	13.3
8/ 6	13:40	334	11.9	633	17.3	17.0	13.4
8/ 6	13:50	338	12.1	578	17.3	17.1	13.4

*
DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 6	14: 0	338	10.7	830	17.2	16.9	13.5
8/ 6	14:10	340	10.4	1039	17.2	16.8	13.4

******END OF FOG EVENT******

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 6	14:20	340	9.0	3959	16.9	16.6	12.9
8/ 6	15: 0	345	7.4	$$$$	16.9	16.2	13.2
8/ 6	16: 0	319	6.6	$$$$	14.7	13.9	11.3
8/ 6	17: 0	25	2.9	$$$$	17.0	16.0	13.7
8/ 6	18: 0	117	3.3	$$$$	17.5	16.2	12.5
8/ 6	19: 0	217	1.3	$$$$	$$$$	$$$$	13.2
8/ 6	20: 0	238	5.6	$$$$	$$$$	$$$$	13.0
8/ 6	21: 0	204	6.4	$$$$	17.8	16.7	11.1
8/ 6	22: 0	$$$	$$$	8405	17.1	16.2	12.2
8/ 6	23: 0	163	3.5	$$$$	16.8	16.4	12.1
8/ 7	0: 0	197	9.7	9489	16.1	15.9	11.7
8/ 7	1: 0	194	8.4	9848	15.7	15.4	11.5
8/ 7	2: 0	$$$	$$$$	$$$$	16.1	15.8	12.2
8/ 7	3: 0	$$$	$$$$	$$$$	15.9	15.7	12.2
8/ 7	4: 0	$$$	$$$$	8515	15.9	15.7	12.2
8/ 7	5: 0	282	6.8	$$$$	17.3	16.7	12.9
8/ 7	6: 0	271	4.9	$$$$	17.7	16.6	13.5
8/ 7	7: 0	285	6.1	2045	17.7	17.4	13.9

******START OF FOG EVENT******

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 7	7:10	272	6.0	439	17.7	17.4	13.6
8/ 7	7:20	266	6.9	227	17.6	17.4	13.4
8/ 7	7:30	291	8.8	267	17.5	17.3	12.4
8/ 7	7:40	273	7.5	209	17.1	17.0	12.8
8/ 7	7:50	267	7.7	206	16.9	16.8	12.4
8/ 7	8: 0	$$$	$$$	259	16.8	16.7	12.4
8/ 7	8:10	248	5.9	232	16.7	16.6	12.7
8/ 7	8:20	239	5.4	283	16.7	16.5	12.7
8/ 7	8:30	252	6.5	245	16.6	16.5	12.8
8/ 7	8:40	231	6.4	870	16.6	16.6	12.7

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 7	8:50	218	7.0	978	16.7	16.6	12.8
8/ 7	9: 0	208	8.8	550	16.7	16.6	12.7
8/ 7	9:10	190	11.8	626	16.5	16.4	13.0
8/ 7	9:20	$$$	$$$	642	16.3	16.2	13.2
8/ 7	9:30	206	10.0	572	16.3	16.1	12.9
8/ 7	9:40	218	12.0	466	16.3	16.1	12.9
8/ 7	9:50	212	7.8	621	16.4	16.3	13.1
8/ 7	10: 0	224	6.5	284	16.4	16.2	13.2
8/ 7	10:10	223	8.2	305	16.4	16.3	13.1
8/ 7	10:20	230	7.5	198	16.5	16.3	13.0
8/ 7	10:30	246	6.2	202	16.6	16.4	13.1
8/ 7	10:40	$$$	$$$	203	16.6	16.5	13.2
8/ 7	10:50	259	6.6	215	16.7	16.5	13.0
8/ 7	11: 0	252	6.2	227	16.7	16.6	13.1
8/ 7	11:10	261	7.2	369	17.0	16.7	13.2

******END OF FOG EVENT******

8/ 7	12: 0	$$$	$$$$	662	17.2	16.9	13.6
8/ 7	13: 0	311	7.3	8142	17.1	14.5	13.2
8/ 7	14: 0	332	12.7	5313	16.8	16.0	12.9
8/ 7	15: 0	316	15.8	5620	16.5	16.0	12.6
8/ 7	16: 0	312	14.5	7529	16.8	16.0	12.9
8/ 7	17: 0	302	11.3	4682	16.6	16.0	13.0
8/ 7	18: 0	304	13.1	7573	16.6	15.9	12.7
8/ 7	19: 0	291	13.0	6122	16.5	15.9	12.4
8/ 7	20: 0	269	13.1	8211	16.2	15.7	12.6
8/ 7	21: 0	293	15.7	5838	16.1	15.7	12.4

******START OF FOG EVENT******

8/ 7	21:40	294	12.5	1465	15.9	15.6	12.6
8/ 7	21:50	303	15.9	817	15.8	15.6	12.5
8/ 7	22: 0	307	17.9	744	15.7	15.6	12.4
8/ 7	22:10	311	13.1	920	15.6	15.5	12.4
8/ 7	22:20	296	8.9	665	15.5	15.4	11.6
8/ 7	22:30	299	7.4	711	15.4	15.3	11.5
8/ 7	22:40	$$$	$$$$	551	15.3	15.2	11.4
8/ 7	22:50	262	9.1	676	15.2	15.2	11.6
8/ 7	23: 0	247	3.7	624	15.2	15.2	11.6
8/ 7	23:10	284	7.6	446	15.3	15.2	11.9
8/ 7	23:20	295	11.4	409	15.3	15.2	11.7
8/ 7	23:30	291	8.7	557	15.3	15.3	12.0
8/ 7	23:40	284	7.2	500	15.4	15.3	12.3
8/ 7	23:50	282	8.7	578	15.4	15.3	12.1

* DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	0: 0	$$$	$$$$	590	15.4	15.4	11.6
8/ 8	0:10	304	11.1	1150	15.4	15.4	12.0
8/ 8	0:20	286	9.8	1163	15.6	15.6	12.0
8/ 8	0:30	238	12.0	915	15.5	15.5	12.0
8/ 8	0:40	289	15.9	1935	15.6	15.6	12.0
8/ 8	0:50	295	12.5	2806	15.7	15.6	12.2
8/ 8	1: 0	275	10.3	2291	15.7	15.7	12.2
8/ 8	1:10	282	10.3	936	15.8	15.7	12.1
8/ 8	1:20	$$$	$$$$	599	15.8	15.7	12.0
8/ 8	1:30	265	6.8	1426	15.8	15.8	12.1

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	2: 0	306	8.2	6577	15.8	15.7	12.3
8/ 8	3: 0	308	8.9	5455	15.7	15.6	12.4

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	3:40	314	9.0	1495	15.7	15.7	12.2
8/ 8	3:50	319	8.9	537	15.7	15.7	12.0
8/ 8	4: 0	$$$	$$$$	366	15.7	15.6	12.1
8/ 8	4:10	322	7.0	292	15.6	15.6	12.0
8/ 8	4:20	312	6.5	308	15.6	15.6	11.8
8/ 8	4:30	305	5.6	288	15.4	15.4	11.6
8/ 8	4:40	308	6.0	258	15.3	15.3	11.5
8/ 8	4:50	312	6.4	299	15.3	15.3	11.6
8/ 8	5: 0	306	6.8	229	15.4	15.3	11.6
8/ 8	5:10	302	6.1	232	15.5	15.5	12.4
8/ 8	5:20	$$$	$$$$	223	15.7	15.6	11.8
8/ 8	5:30	300	6.4	311	15.8	15.7	11.6
8/ 8	5:40	290	8.2	295	15.6	15.6	11.7
8/ 8	5:50	289	7.7	260	15.7	15.7	11.7
8/ 8	6: 0	282	4.8	234	15.7	15.7	12.1
8/ 8	6:10	289	5.8	208	15.8	15.8	11.6
8/ 8	6:20	290	7.1	260	15.9	15.8	11.5

◆ DATA TAKEN FROM BOW

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	6:30	313	5.0	247	15.9	15.9	12.0
8/ 8	6:40	$$$	$$$$	262	16.0	15.9	12.1
8/ 8	6:50	304	7.8	271	16.0	15.9	12.7
8/ 8	7: 0	307	6.6	236	16.1	16.0	12.8
8/ 8	7:10	287	5.5	289	16.2	16.1	12.8
8/ 8	7:20	275	3.9	248	16.2	16.2	12.7
8/ 8	7:30	290	4.9	250	16.3	16.2	12.9
8/ 8	7:40	308	6.6	235	16.4	16.3	13.5
8/ 8	7:50	294	7.4	298	16.4	16.4	13.7
8/ 8	8: 0	$$$	$$$$	342	16.5	16.4	13.0
8/ 8	8:10	283	9.4	416	16.5	16.4	13.8
8/ 8	8:20	292	8.8	457	16.5	16.3	13.4
8/ 8	8:30	300	8.4	501	16.5	16.4	13.0
8/ 8	8:40	295	6.8	481	16.5	16.4	13.1
8/ 8	8:50	310	5.7	503	16.5	16.4	13.3
8/ 8	9: 0	285	5.4	406	16.5	16.4	13.1
8/ 8	9:10	$$$	$$$$	389	16.5	16.4	13.1
8/ 8	9:20	$$$	$$$$	537	16.5	16.4	12.9
8/ 8	9:30	311	5.6	440	16.5	16.4	13.0
8/ 8	9:40	15	3.8	476	16.5	16.4	13.0
8/ 8	9:50	8	3.6	377	16.5	16.5	12.9
8/ 8	10: 0	16	6.9	635	16.5	16.5	13.0
8/ 8	10:10	24	5.2	369	16.6	16.5	13.1
8/ 8	10:20	23	7.1	512	16.5	16.4	13.3
8/ 8	10:30	40	6.0	488	16.5	16.4	13.3
8/ 8	10:40	$$$	$$$$	476	16.4	16.3	13.7

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

8/ 8	10:50	79	5.3	2196	16.3	16.1	13.6
8/ 8	11: 0	70	6.3	3743	16.3	16.1	13.2
8/ 8	11:40	53	10.9	662	15.9	15.7	13.0

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

8/ 8	12: 0	$$$	$$$$	452	15.9	15.8	13.3

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DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	12:10	57	14.7	451	15.7	15.5	13.0
8/ 8	12:20	61	14.8	632	15.5	15.3	12.6
8/ 8	12:30	72	14.0	786	$$$$	$$$$	12.4
8/ 8	12:40	39	11.0	812	$$$$	$$$$	12.8
8/ 8	12:50	64	13.6	606	15.3	15.3	11.9
8/ 8	13: 0	64	15.4	444	15.2	15.0	11.7
8/ 8	13:10	70	18.2	423	15.2	15.0	11.8
8/ 8	13:20	$$$	$$$$	906	15.2	14.9	12.1
8/ 8	13:30	72	18.8	860	15.1	14.9	12.2
8/ 8	13:40	70	17.8	752	14.9	14.5	12.2

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DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	13:50	71	17.5	5493	14.7	14.4	12.3
8/ 8	14: 0	76	17.7	$$$$	14.1	$$$$	12.1
8/ 8	15: 0	75	14.7	$$$$	14.7	14.2	12.1
8/ 8	16: 0	65	13.5	$$$$	14.6	13.8	12.3
8/ 8	17: 0	57	13.0	$$$$	14.8	12.6	11.8
8/ 8	18: 0	59	8.7	$$$$	15.1	12.7	11.8
8/ 8	19: 0	66	10.0	$$$$	15.1	13.0	11.6
8/ 8	20: 0	79	9.9	$$$$	14.8	13.9	12.4
8/ 8	21: 0	78	7.8	$$$$	15.1	13.8	12.3
8/ 8	22: 0	89	12.3	$$$$	15.0	14.1	12.4
8/ 8	23: 0	74	9.3	3415	$$$$	$$$$	12.6

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 8	23:10	38	4.0	1782	$$$$	$$$$	12.7
8/ 8	23:20	94	9.0	1466	14.6	14.3	12.4
8/ 8	23:30	111	8.4	721	14.5	14.3	12.0
8/ 8	23:40	99	8.6	809	14.5	14.3	12.2
8/ 8	23:50	124	8.3	731	14.5	14.2	12.0
8/ 9	0: 0	172	10.8	703	14.5	14.3	12.2
8/ 9	0:10	97	4.5	844	14.5	14.4	11.9

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	0:20	89	5.5	7236	14.2	14.0	11.9

◆ DATA TAKEN FROM BOW

HAYES FOG CRUISE
JULY - AUGUST 1975

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	1: 0	$$$	$$$$	$$$$	14.4	13.7	11.3
8/ 9	2: 0	213	4.2	$$$$	14.4	13.4	11.4

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	2:30	190	5.0	1481	13.9	13.7	12.3
8/ 9	2:40	200	3.1	819	13.9	13.7	12.2
8/ 9	2:50	313	15.0	1653	14.0	13.8	12.2
8/ 9	3: 0	170	3.9	1556	14.0	13.8	12.2
8/ 9	3:10	213	3.2	1275	14.3	14.1	12.2
8/ 9	3:20	196	1.6	1185	14.5	14.4	12.2
8/ 9	3:30	204	1.4	8924	14.5	14.4	12.2
8/ 9	3:40	90	1.8	952	14.6	14.5	12.1
8/ 9	3:50	75	3.0	1433	14.8	14.7	12.2
8/ 9	4: 0	$$$	$$$$	1849	14.9	14.9	12.1
8/ 9	4:10	78	3.6	4727	14.9	14.9	12.3
8/ 9	4:20	63	3.5	1856	15.0	15.0	12.3
8/ 9	5: 0	86	5.8	1264	15.2	15.2	12.2
8/ 9	5:10	68	5.9	1070	15.2	15.2	12.6
8/ 9	5:20	$$$	$$$$	1421	15.4	15.3	12.6
8/ 9	5:30	$$$	$$$$	1405	15.5	15.6	12.5

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DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	5:40	84	5.5	3171	15.5	15.5	12.4
8/ 9	6: 0	68	5.1	5727	15.8	15.8	12.7

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DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	6:20	52	5.7	1974	15.9	15.8	12.9
8/ 9	6:30	45	6.1	1710	16.0	15.9	12.9
8/ 9	6:40	350	10.0	1721	16.1	16.0	13.1
8/ 9	6:50	51	4.2	1110	16.1	16.1	12.9
8/ 9	7: 0	63	5.5	697	16.2	16.2	13.1
8/ 9	7:10	75	5.0	750	16.2	16.2	12.9

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DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	7:20	51	8.1	708	16.2	16.2	12.8
8/ 9	7:30	62	5.9	622	16.3	16.3	12.9
8/ 9	7:40	37	4.9	891	16.4	16.3	13.0
8/ 9	7:50	75	5.6	658	16.4	16.4	13.2
8/ 9	8: 0	$$$	$$$$	594	16.5	16.4	12.9
8/ 9	8:10	47	8.9	537	16.4	16.4	12.7
8/ 9	8:20	39	9.6	557	16.2	16.2	12.7
8/ 9	8:30	48	8.4	889	16.2	16.1	12.6
8/ 9	8:40	33	8.3	782	16.1	16.1	12.6
8/ 9	8:50	$$$	$$$$	869	16.1	16.0	12.8
8/ 9	9: 0	$$$	$$$$	1038	16.1	16.1	13.0
8/ 9	9:10	73	10.6	1357	16.1	16.0	13.1

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8/ 9	9:20	$$$	$$$$	3382	16.0	15.9	13.1
8/ 9	10: 0	73	11.6	6533	15.4	15.2	13.2
8/ 9	11: 0	82	9.0	8405	15.2	15.0	12.8
8/ 9	12: 0	103	8.7	3199	14.9	14.7	12.8
8/ 9	13: 0	97	5.0	$$$$	15.0	13.1	12.4
8/ 9	14: 0	310	1.6	9420	15.1	14.5	13.3
8/ 9	15: 0	271	7.5	$$$$	15.4	14.4	12.4
8/ 9	16: 0	250	7.0	$$$$	15.9	14.7	12.0
8/ 9	17: 0	243	4.3	$$$$	15.5	14.8	12.5
8/ 9	18: 0	249	4.7	$$$$	15.6	14.9	12.8
8/ 9	19: 0	270	4.9	$$$$	15.9	14.8	13.2
8/ 9	20: 0	291	4.5	$$$$	16.0	15.1	12.3
8/ 9	21: 0	316	4.6	$$$$	15.8	15.1	12.4

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8/ 9	21:10	318	6.3	451	15.4	15.0	12.0
8/ 9	21:20	302	5.3	458	15.4	15.0	11.9
8/ 9	21:30	313	5.0	440	15.3	15.0	12.2
8/ 9	21:40	321	5.5	410	15.2	15.0	12.1

◆
DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	21:50	347	3.0	252	15.4	15.2	12.3
8/ 9	22: 0	33	2.2	409	15.5	15.4	12.6
8/ 9	22:10	11	2.4	610	15.6	15.4	12.1
8/ 9	22:20	10	2.6	1048	15.6	15.5	13.0

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/ 9	22:30	16	3.4	3189	15.7	15.6	12.8
8/ 9	23: 0	177	.8	9582	16.0	15.8	13.3
8/10	0: 0	146	10.5	$$$$	16.6	15.9	13.0
8/10	1: 0	158	4.1	$$$$	16.8	16.3	13.3
8/10	1:30	284	6.5	472	17.2	14.9	13.5
8/10	2: 0	269	6.5	$$$$	17.4	15.1	13.5
8/10	3: 0	309	3.6	$$$$	16.9	16.1	13.4
8/10	4: 0	23	3.6	$$$$	17.4	16.6	13.9
8/10	5: 0	14	5.1	$$$$	17.6	16.8	14.1
8/10	6: 0	279	3.0	$$$$	18.5	16.4	14.0
8/10	7: 0	6	1.8	$$$$	18.6	16.6	15.1
8/10	8: 0	43	7.6	$$$$	18.8	17.2	14.4
8/10	9: 0	46	9.2	$$$$	18.9	17.0	15.3
8/10	10: 0	107	7.9	$$$$	19.0	16.9	15.2
8/10	11: 0	76	10.5	$$$$	18.3	16.8	15.3
8/10	12: 0	103	10.2	$$$$	17.7	16.3	17.5
8/10	15: 0	113	9.1	$$$$	17.5	15.6	15.3
8/10	16: 0	129	9.6	$$$$	17.0	15.7	15.2
8/10	17: 0	131	9.1	$$$$	16.9	15.7	15.1
8/10	18: 0	137	8.9	$$$$	16.2	15.1	15.2
8/10	19: 0	157	7.0	$$$$	16.6	15.2	14.4
8/10	20: 0	171◆	8.0◆	$$$$	17.2	15.4	13.8
8/10	20:50	$$$	$$$$	571	15.9	15.2	14.4
8/10	21: 0	$$$	$$$$	1077	15.9	15.4	14.5
8/10	21:10	$$$	$$$$	1282	15.9	15.4	14.8
8/10	21:20	$$$	$$$$	3736	16.0	15.6	14.5
8/10	21:40	$$$	$$$$	1085	16.1	15.8	14.7
8/10	21:50	$$$	$$$$	617	16.0	15.7	14.3

◆ DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/10	22: 0	$$$	$$$$	694	16.1	16.0	14.6
8/10	22:10	$$$	$$$$	4075	16.4	16.2	14.4
8/10	23: 0	207	6.5	$$$$	17.4	16.5	14.5
8/11	0: 0	$$$	$$$$	$$$$	17.5	16.9	15.4
8/11	1: 0	173	13.0	$$$$	18.0	17.6	15.3
8/11	2: 0	180	8.5	8571	18.0	17.6	15.1

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/11	2:30	178	10.2	1198	17.8	17.6	15.3
8/11	2:40	$$$	$$$$	414	17.8	17.5	15.0
8/11	2:50	177	10.0	376	17.6	17.6	14.9
8/11	3: 0	166	14.2	286	17.7	17.6	15.0
8/11	3:10	170	13.7	265	17.6	17.7	15.0
8/11	3:20	179	10.2	257	17.7	17.5	15.3
8/11	3:30	190	6.4	218	17.6	17.5	15.3
8/11	3:40	186	6.8	391	17.3	17.2	15.2
8/11	3:50	177	8.8	478	17.3	17.1	15.3
8/11	4: 0	174	7.9	571	17.3	17.2	15.0
8/11	4:10	173	7.7	453	17.4	17.3	15.3
8/11	4:20	165	9.0	380	17.3	17.3	15.1
8/11	4:30	171	7.4	347	17.3	17.3	15.0
8/11	4:40	183	3.7	305	17.2	17.1	15.1
8/11	4:50	165	7.1	418	17.3	17.2	15.1
8/11	5: 0	162	6.4	836	17.4	17.3	15.2
8/11	5:10	188	3.1	837	17.4	17.3	15.0
8/11	5:20	182	5.4	1478	17.4	17.3	15.2
8/11	5:30	179	4.7	1598	17.4	17.3	15.0
8/11	5:40	203	1.6	1079	17.4	17.4	14.9
8/11	5:50	165	5.4	534	17.5	17.4	15.1
8/11	6: 0	156	6.1	1111	17.5	17.4	15.3
8/11	6:10	138	3.3	1288	17.5	17.4	15.3
8/11	6:40	305	7.0	1268	17.5	17.4	15.6
8/11	6:50	289	2.6	790	17.6	17.5	15.7
8/11	7: 0	217	1.3	431	17.6	17.5	15.5

◆
DATA TAKEN FROM BOW

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/11	7:10	282	2.8	915	17.6	17.5	15.6

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/11	7:20	275	3.0	7040	17.8	17.7	15.5
8/11	8: 0	175	4.9	$$$$	18.2	18.1	15.0
8/11	9: 0	$$$	$$$$	8280	17.9	17.7	15.0
8/11	10: 0	317	6.9	$$$$	18.0	16.6	15.2
8/11	11: 0	222	6.2	$$$$	18.0	16.3	15.0

◆◆◆◆◆◆START OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/11	11:50	$$$	$$$$	1258	17.1	16.3	15.9
8/11	12: 0	$$$	$$$$	469	16.4	15.8	15.7
8/11	12:10	$$$	$$$$	451	16.4	15.9	15.7
8/11	12:20	$$$	$$$$	1632	16.3	15.9	15.8

◆◆◆◆◆◆END OF FOG EVENT◆◆◆◆◆◆

DATE	TIME	WD	WS	VSBY	AIR	DP	SST
8/11	12:30	$$$	$$$$	2250	16.2	15.8	15.3
8/11	13: 0	$$$	$$$$	4981	16.0	15.8	15.3
8/11	14: 0	$$$	$$$$	2293	16.4	15.9	15.4
8/11	15: 0	$$$	$$$$	5242	17.4	16.0	15.2
8/11	16: 0	$$$	$$$$	3912	17.6	16.6	15.8
8/11	17: 6	$$$	$$$$	3294	17.4	16.4	15.7
8/11	18: 0	124	15.3	4462	17.3	16.2	15.5
8/11	19: 0	$$$◆	$$$$◆	6771	17.9	16.6	15.7
8/11	20: 0	$$$◆	$$$$◆	7303	18.4	17.1	15.7
8/11	21: 0	$$$◆	$$$$◆	7573	18.6	16.6	15.1
8/11	22: 0	$$$◆	$$$$◆	6724	18.5	16.6	15.4

THE SHIPBOARD COMPUTER SYSTEM

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DATA ACQUISITION SYSTEM

Many of the sensors used on the cruise were interfaced to NRL's shipboard computer which was configured for this cruise as diagrammed in Figure 1. The computer served as a data logging device, a real-time data processor and plotter, and as an automatic ship navigation system.

Data was acquired and processed by a HP2100S computer with 32K memory operating under Hewlett-Packard Real Time Executive. Programs and temporary data were stored on a HP7900 disk while two HP7970, 9-track magnetic tape units provided a permanent data log. The system's main terminal was a HP2615 CRT device, while a Tektronix 4012 unit served as an auxiliary terminal used mainly for plotting. An analog HP2323 Data Acquisition System with multiplexer and A/D converter sampled 26 channels of data. In addition, a high speed multiplexing A/D converter was used to acquire ten additional channels of data. In all, there were 83 channels of both analog and digital data coupled to the computer and these are listed in Table 1. Most of the channels were sampled once per minute, but the sampling rates ranged from 100 per second to once every 10 minutes.

DATA HANDLING PROCEDURE

All data was immediately logged on magnetic tape in raw form. In addition, most of the data was also stored temporarily on disk for real-time processing. For monitoring purposes, certain data was converted into physically meaningful units and logged on the line printer every 15 minutes. Because of the changing state of several experimental instruments and their calibration constants, this log is not considered to be a final log of the data, but rather a rough real-time indicator of conditions. Final reports were prepared from the data logged directly on magnetic tape.

REAL-TIME KITE BALLOON MONITOR

Atmospheric soundings of pressure, temperature, and humidity were transmitted from a tethered kite balloon with a three channel telemetry system. Disk files of this data were maintained enabling immediate access to the data for the last ten balloon flights and real-time profiles of temperature and humidity versus time were plotted on the graphics terminal at will either during or after the flights. See Figure 2 for an example.

REAL-TIME ANALYSIS OF ATMOSPHERIC ELECTRICITY VARIABLES

The atmospheric electricity investigation utilized 18 channels of data sampled at either 1Hz or 100Hz. The most recent 2048 samples of each channel were stored on the disk and a program was available to plot the most recent power spectrum of any channel on the Tektronix terminal. A second plotting program was available to plot any of the channels versus time. Both programs proved very useful because they provided a quick means of monitoring both the operation of the sensors and the values of the parameters.

AUTOMATIC SHIP NAVIGATION SYSTEM

The ship was expected to be operating in an area which is covered by the East Coast Loran C net where reception is generally good. The computer would read the Loran C receiver every minute and convert the readings to latitude and longitude and log this position on magnetic tape and on the disk. Every 15 minutes the computer calculated the least squares straight line fit to the positions stored on the disk. This fit was used to determine the ship's speed and course made good during that 15 minute period. These smoothed values were printed on the line printer along with data from the various sensors. The smoothed speed and course was used to derive true wind from the relative wind. The ship's heading (as distinguished from ship's course made good) is also required for true wind calculations. The interface to the ship's compass was not functioning properly during this cruise, so ship's heading was manually entered at suitable intervals.

Unfortunately, portions of the actual cruise track were in a marginal Loran C area and problems did occur. It is the nature of Loran C receivers that noise may cause the receiver to lock on the wrong cycle of the signal envelope. (This is especially likely to occur during radio transmissions from the ship). This causes readings to jump by multiples of ten microseconds. These jumps, of course, result in position errors which show up as discontinuities in the ship's track. These discontinuities were not detected by the computer during the cruise, but were later manually edited out of the data to obtain a smoothed track and corrected navigation points.

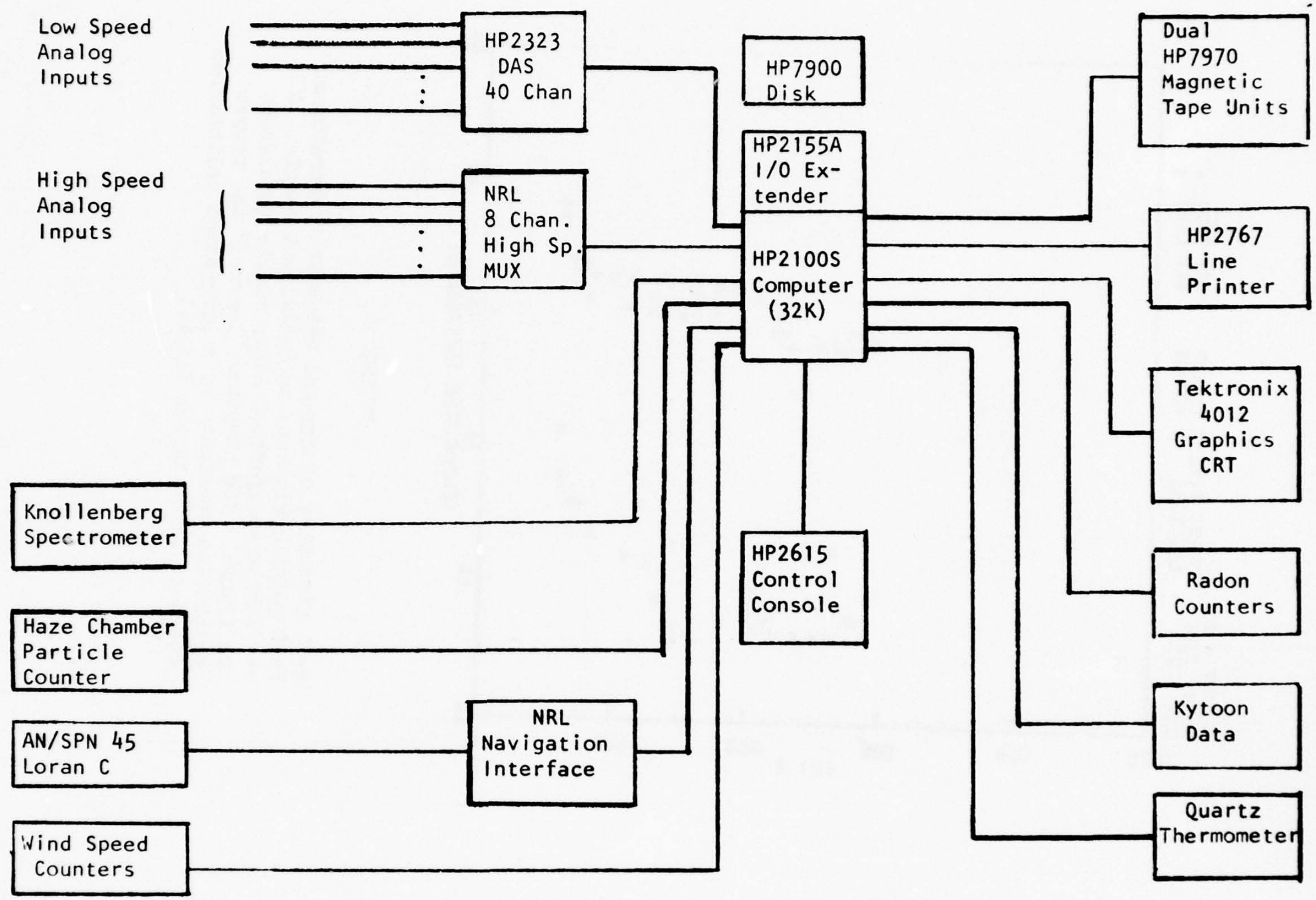

Fig. 1 - Functional diagram of NRLs Oceanographic Computer System

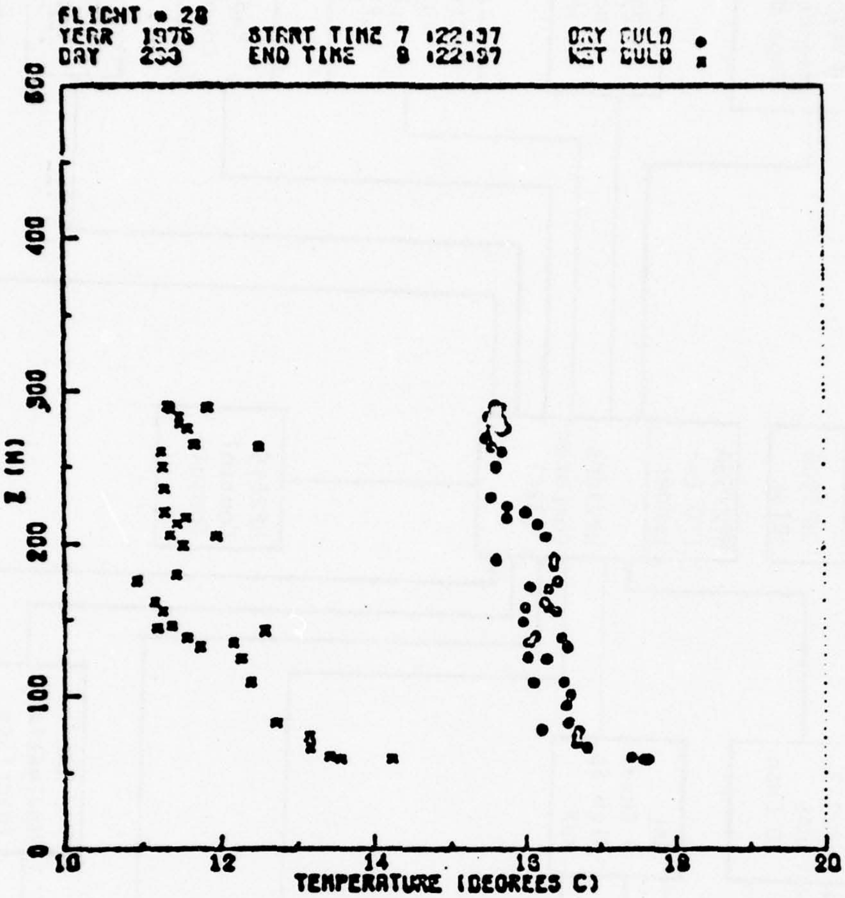

FIGURE 2

Real time plot of dry and wet bulb temperatures. Each point represents an individual sample. A new sample was plotted every minute throughout the flight. The computer "learned" the proper calibration constants by a programmed calibration procedure prior to the Flight.

Table I - Marine Fog and Navigational Sensors Interfaced with the Oceanographic Computer

HP 2323 Data Acquisition System Channel Assignments

Channel	Sensor		Rate
0	Positive Ion Conductivity		1/Second
1	Negative Ion Conductivity		1/Second
2	Electrostatic Potential		1/Second
3	Current Density		1/Second
4	Space Charge Density		1/Second
5	Potential Gradient		1/Second
6	Vertical Acceleration		1/Second
7	Vertical Velocity		1/Second
8	Wind Direction 1		1/Second
9	Wind Direction 2		1/Second
10	Fog Conductivity		1/(3 Seconds)
11	Air Temperature		1/Minute
12	Dew Point		1/Minute
13	Radiometer Temperature		1/Minute
14	NRL Visibility Meter		1/Minute
15	Kytoon Tension		1/Minute
16	Hot Wire Anemometer 1		1/Minute
17	Hot Wire Anemometer 2		1/Minute
18	Refractometer 1		1/Minute
19	Temperature 1		1/Minute
20	Refractometer 2		1/Minute
21	Temperature 2		1/Minute
22	Nephelometer		1/Minute
23	Scattering Coefficient		1/Minute
24	Wind Speed	bivane	1/Minute
25	Wind Azimuth	bivane	1/Minute
26	Wind Elevation	bivane	1/Minute

Table I (Continued) - Marine Fog and Navigational Sensors Interfaced with the Oceanographic Computer

<u>Individual Computer Interface</u>

Haze Chamber Particle Counter	5 multiplexed channels, variable rate
Loran C	1/Min
Radon Counter 1	1/Min
Radon Counter 2	1/(10 Min)
Knollenberg Particle Spectrometer	32 channels, 1/Min
Kytoon Data	4 channels, variable rate
Quartz Thermometer	1/(48 Seconds)
Wind Speed Counter 1	1/Min
Wind Speed Counter 2	1/Min

<u>High Speed Multiplexing A/D Converter</u>

1	Longitudinal Wind Velocity	100/Second
2	Transverse Wind Velocity	
3	Temperature	
4	Space Charge Density	
5	Humidity	
6	Electrostatic Potential	
7	Vertical Velocity	
8	Vertical Acceleration	
9	Current Density	
10	Potential Gradient	

REDUCED DATA FROM CALSPAN'S PARTICIPATION

IN THE USNS HAYES CRUISE OFF THE COAST OF NOVA SOCTIA,

29 JULY - 12 AUGUST 1975

BY

Eugene J. Mack, Ulrich Katz, and John Y. Yang

February 1976

INTRODUCTION

A major objective of Calspan's participation in the Summer 1975 cruise aboard the USNS HAYES was to obtain data describing the micrometeorological and microphysical characteristics of marine fogs occurring in the area off the Southeast coast of Nova Scotia. Calspan's participation in the cruise was limited to the period from departure at Williamsburg, Virginia, on 28 July to arrival at Halifax on 12 August 1975. The cruise was highly successful, having encountered approximately 18 distinct fog occurrences and logging approximately 95 hours of observations in fog with visibility <5000 m, including 65 hours of dense fog (visibility <1000 m). The major portion of Calspan data obtained during the cruise is presented in this volume in reduced form with minimal interpretation for objective use by other participants of the cruise. The remaining Calspan data on surface chemistry were acquired under a different contract and are reported separately.

INSTRUMENTATION

Calspan instrumentation mounted aboard the HAYES is listed in Table 1. A 4 m high tower-platform (1.5 x 1.8 m on the sides) was constructed and installed on the flying bridge to provide for exposure of fog microphysics instrumentation adequately above the level of ship's influence. The drop sampler, fog water collector, air sampling apparatus, and visibility monitor were mounted atop the tower. The base of the tower was enclosed to provide shelter for the nucleus chambers and various recorders.

A specially-designed vehicle, housing a temperature sensor, was constructed from a 0.5 m length 2.5 inch pipe and towed between the twin hulls of the ship to provide a continuous measure of surface water temperature. Air temperature was measured at three heights (7.5, 17 and 28 m) above the sea surface and dew point temperature was monitored at two levels (17 and 28 m).

During the cruise, fog was encountered almost nightly for a ten-day period beginning on 2 August. Visibility, air and water temperature, and

dew point* were monitored continuously; in excess of 450 measurements of drop dize distribution and over 160 samples of fog water were also obtained. Many additional samples of fog water were provided to other researchers participating in the cruise. Numerous measurements of the cloud nucleus spectrum and hi-vol samples of atmospheric aerosols (for chemical analysis) were also acquired during periods between fog events, providing data on the characteristics of the air masses in which the fogs formed.

Table A-1.

CALSPAN INSTRUMENTATION INSTALLED ON USNS HAYES, AUGUST 1975

Instrument*	Height Above Sea Surface
Temperature Sensors (Foxboro)	sea surface, 7.5, 17, 28 m
Dew Point Sensors (Foxboro)	17, 28 m
Forward Scatter Visibility (EG&G)	21 m
Drop Sampler (Calspan)	20 m
Fog Water Collector (Calspan)	20 m
Air Chemistry (Hi-Vol Sampler)	18 m
Cloud Nucleus Chamber (Calspan)	18 m
Haze Nucleus Chamber (Calspan)	18 m

*Detailed descriptions of individual instruments may be found elsewhere (e.g., Mack et al., 1972, A Field Investigation and Numerical Simulation of Coastal Fog; and Mack et al., 1973, An Investigation of the Microphysical and Micrometeorological Properties of Sea Fog).

*Calspan temperature instrumentation is always field calibrated, but similar calibrations for dew point sensors are not possible in the field. As a result, dew point temperatures are offset from air temperature, and the offset increased gradually (due to instrument drift) with time throughout the duration of the cruise. However, the data from individual sensors are good to approximately $\pm 0.4^{\circ}C$ in a relative sense over periods of hours, and we have chosen to show the dew point data in terms of "relative dew point." We believe that in very dense fog (i.e., visibility<300 m) saturated conditions exist, and therefore the dew point records for individual fogs should be adjusted so that air temperature and dew point match at their respective heights when visibility is <300 m. Care should be taken in making this adjustment because visibility was measured only at the height of the lowest dew point sensor (about 20 m) and occasionally fog depth did not extend up to the level of the upper dew point sensor (28 m).

Ship's Track

Our interpretation of the position of ship's track throughout the 11-day portion of the cruise off the coast of Nova Soctia is shown in a modified version of a plot supplied by G. Schacher (Naval Postgraduate School) in Figure A-1. Our exact interpretations of ship's track are shown in later figures preceding the set of figures for each fog episode. On Figure A-1, the numbers 1 through 11 denote ship's position at the 0000 (EDT) hour of those respective days in August 1975.

Sea Surface Temperature

Our continuous record of sea surface temperature was transferred to the plot of ship's track by picking off min- and max- temperatures from the original strip chart records. These data were then isoplethed to provide the chart of sea surface temperature shown in Figure A-2. The shaded areas superimposed on the sea surface temperature chart represent the portions of ship's track during which visibility (at the 21 m height) was reduced to less than 1000 m.

Fog Numbering System

During the initial analysis, fog events were numbered consecutively, and the same numbers were retained (with letters of the alphabet) for successive encounters with what was thought to be the same fog. To avoid confusion, the Calspan fog numbers were used to label various data from that portion of the ship's track which included the specific fog event. Figure A-3 is a reproduction of Figure A-2 showing the fog numbering system. Later interpretation suggested 18 separate fog occurrences which do not precisely coincide with the numbering system, but the system has been retained for convenience. The separate fog occurrences are delineated in Table A-3.

Cloud Nucleus Spectra

Individual measurements of cloud nucleus spectra obtained with Calspan's static thermal diffusion chamber are shown in Figure A-4. These measurements were obtained during "non-fog" periods in the ambient air masses in which fogs later formed. Haze nucleus* concentrations (not shown on the figure) were typically much less than one per sensitive volume (i.e.,$\ll 10$ cm^{-3}).

Chemistry of Air Mass Aerosol

Throughout the cruise, hi-vol samples of the ambient aerosol were collected over approximate 8-hour intervals during "non-fog" periods, if possible, in the air masses in which fogs later formed. Some indicated samples were

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*Haze nuclei are measured with a modified thermal diffusion chamber and are those particles which grow to $\sim 1\,\mu$m at 98% RH.

unavoidably obtained during fog episodes; and except for minor losses due to droplet fallout, these samples should be representative of the ambient air mass characteristics.

The aerosol particulate samples were collected on 4" diameter Tissuquartz filters (Pallflex Corporation 2500 QAO). Each filter disc was cut into two halves and digested over low heat in two small beakers, each containing 20 ml triple distilled water and adjusted respectively to alkaline and acid pH with sodium hydroxide or sulfuric acid. The filter digestion solution was then filtered under suction and the filtrate reduced by evaporation to 10 ml. Desired analyses* were performed with aliquots of the individual samples, and these data are presented in Table A-2.

Chemistry of Fog Water

During the cruise, 168 discrete 7 ml samples of fog water were collected and retained for later analysis at Calspan; many additional samples were provided to other researchers. The samples were obtained at the 20 m height (to minimize influence by sea spray), and individual samples were collected over periods of from 4 to 15 minutes depending on fog density.

Initial analyses indicated that fog water chemistry did not vary substantially within individual fogs and that each fog, on the average, was slightly different from the others. The remaining samples were then composited into 14 groups corresponding to 14 of the 18 distinct fog occurrences encountered during the cruise. These data, delineation of the 18 fog events, and chemical analysis of their respective fog water may be found in Table A-3. (Quantities of fog water sufficient for chemical analysis were not obtained in fogs numbered 1, 3, 5, and 15). The analysis techniques used for the ambient aerosol samples were also used for the fog water samples.

The Micrometeorology and Microphysics of the Fogs

For analysis purposes, each portion of the ship's track which included a fog penetration was given a "Fog Number". To the extent possible, all data acquired during each fog penetration (including those outside the fog boundaries) were analyzed and computer plotted. These data are provided here in groups corresponding to the fog numbering system shown in Figure A-3. Detailed plots of ship's track, including the 5000 m visibility boundaries of the fog, visibility as a function of time along the track, air, dew point, and sea surface temperatures along the track and drop size distributions** obtained in the fog are grouped for each fog penetration and are presented in Figures A-[illegible] through A-97.

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*Metal ion analyses were performed by atomic absorption; chloride and ammonium ion analyses were performed by specific ion electrode; and sulfate analyses were performed by barium perchlorate titration with Thorin indicator.

**Computed values of drop concentration and liquid water content are provided for each drop size distribution.

The computer plots are annotated with pertinent observations and an estimate of wind direction relative to the ship's heading. The wind directions shown are our estimates based on data provided by NRL and modified by our own observations. Because of uncertainties in the precise determination of ship's heading and spatial and temporal changes in the light wind patterns encountered, the winds are believed good only to $\pm 30^{\circ}$.

FIGURE A-1. PLOT OF THE TRACK OF THE USNS HAYES OFF THE COAST OF NOVA SCOTIA FOR THE PERIOD 1-11 AUGUST 1975.

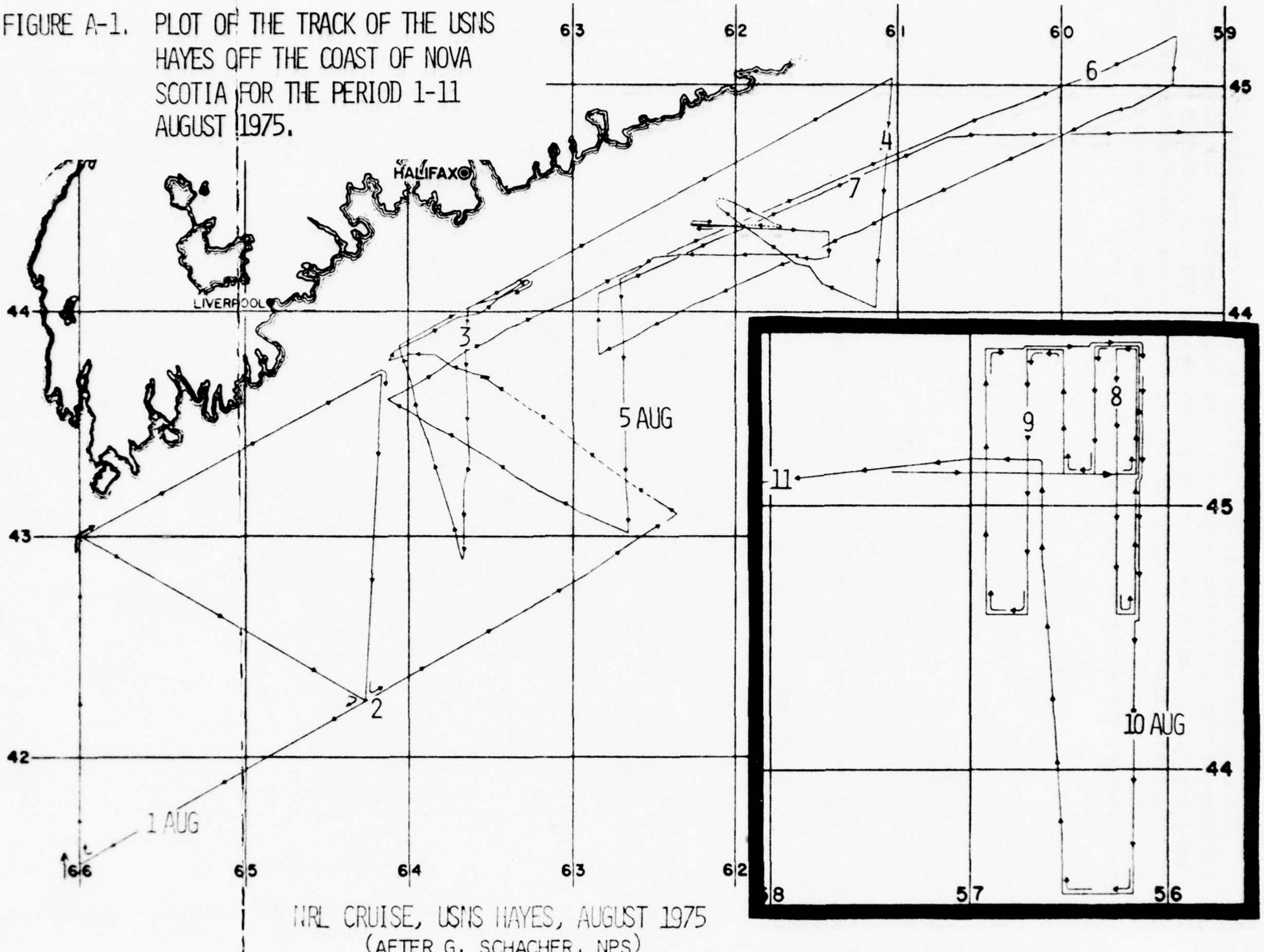
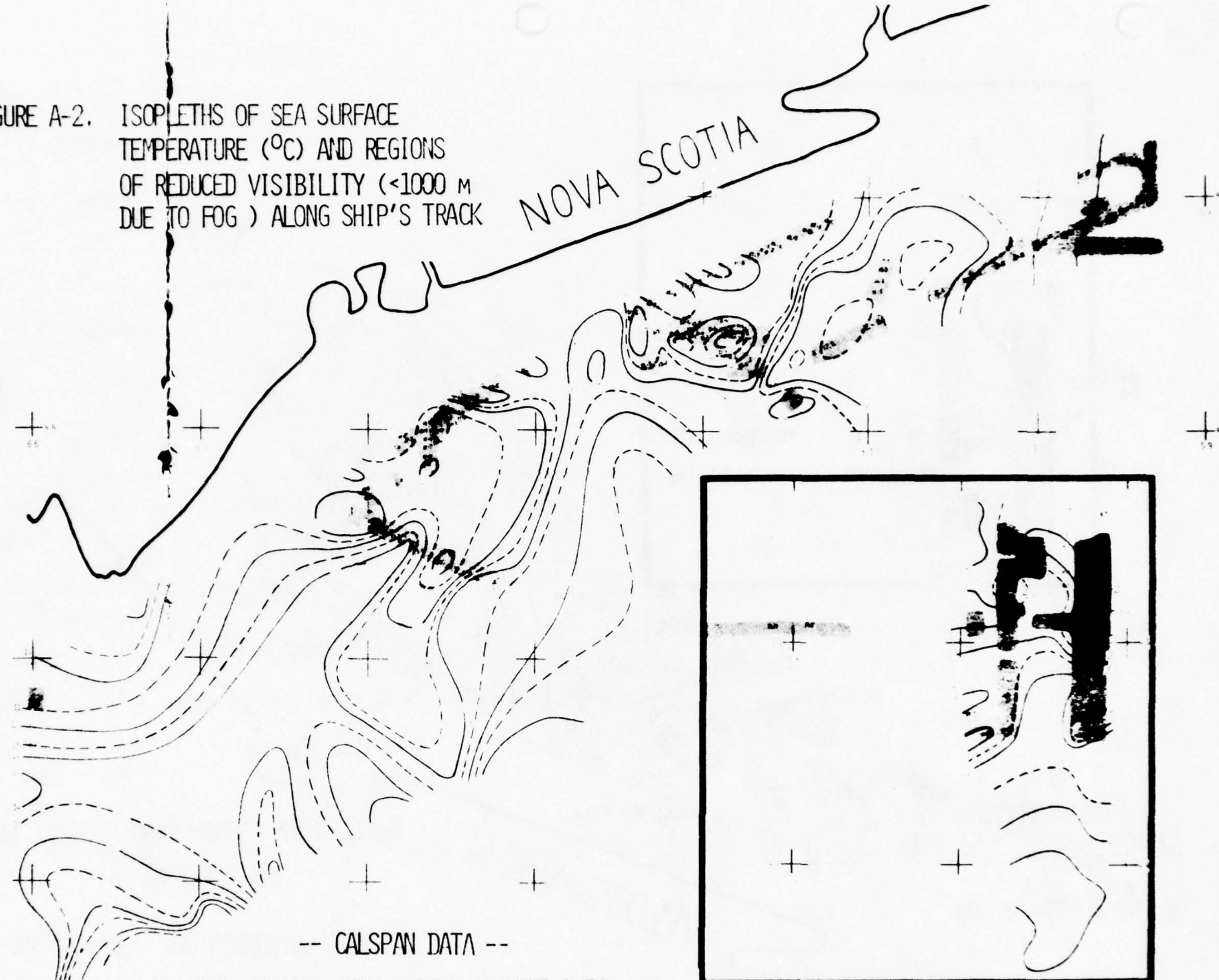


FIGURE A-2. ISOPLETHS OF SEA SURFACE TEMPERATURE (^{o}C) AND REGIONS OF REDUCED VISIBILITY (<1000 M DUE TO FOG) ALONG SHIP'S TRACK



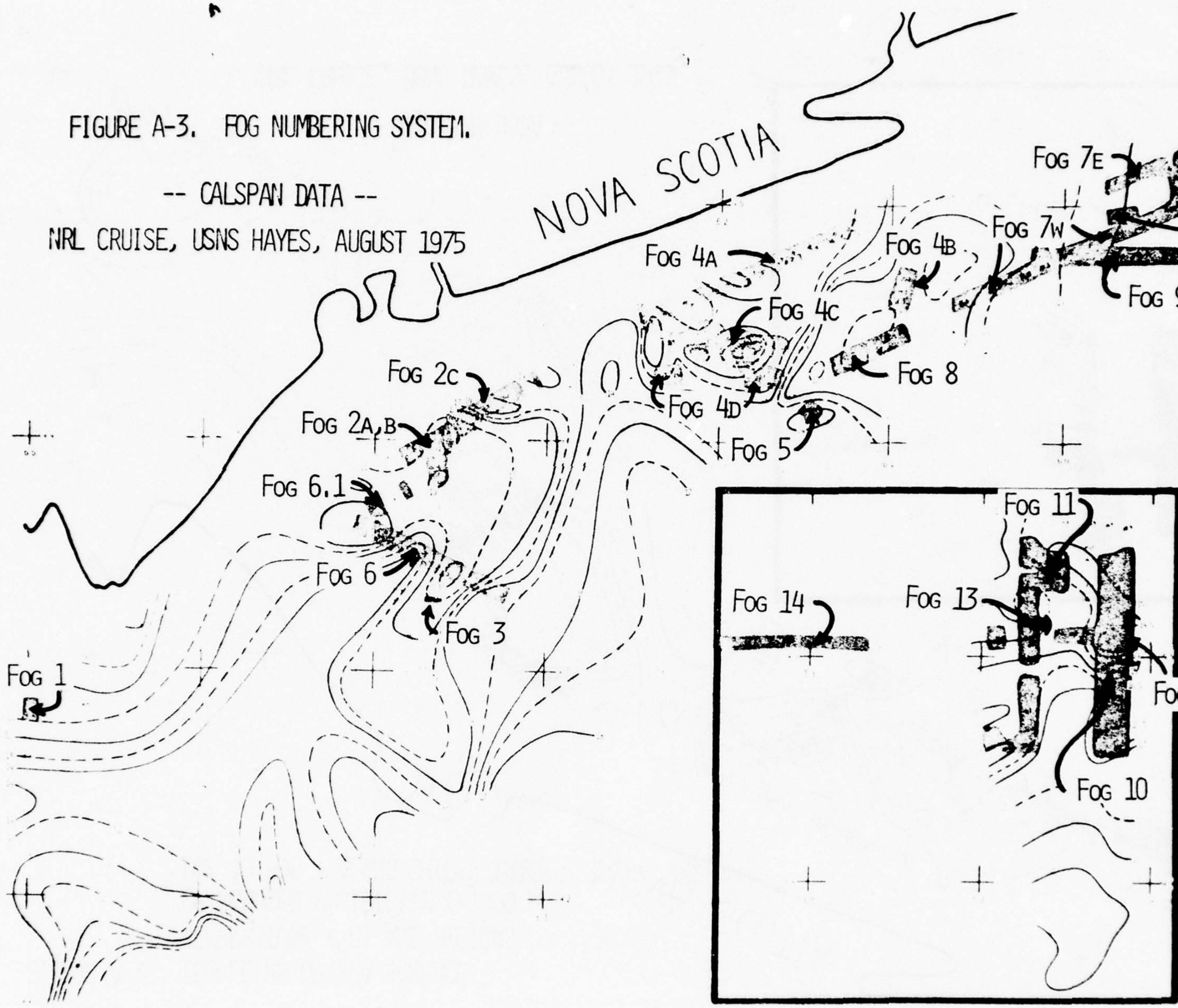
-- CALSPAN DATA --

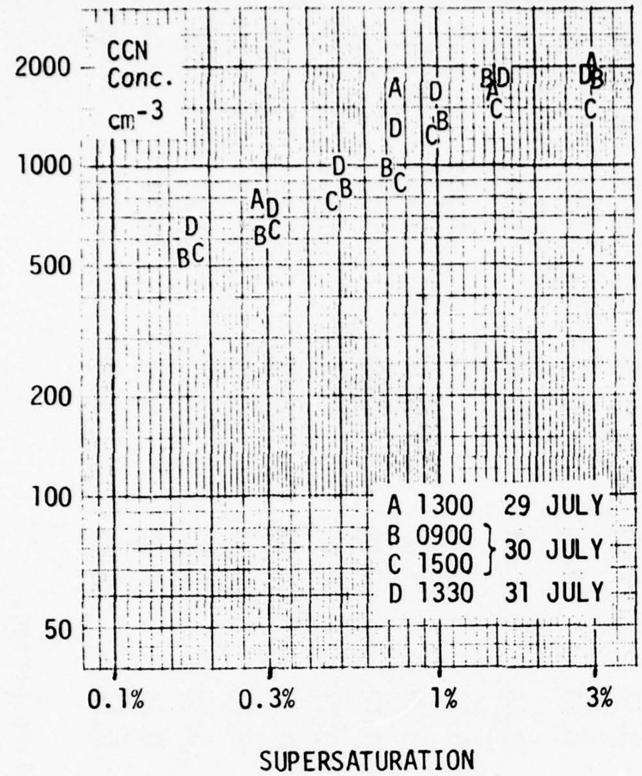
NRL CRUISE, USNS HAYES, AUGUST 1975

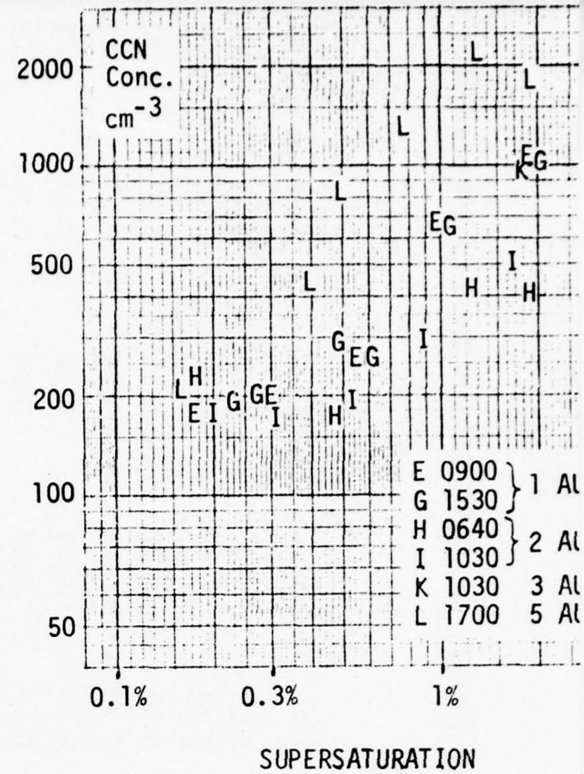
FIGURE A-3. FOG NUMBERING SYSTEM.

-- CALSPAN DATA --

NRL CRUISE, USNS HAYES, AUGUST 1975







NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

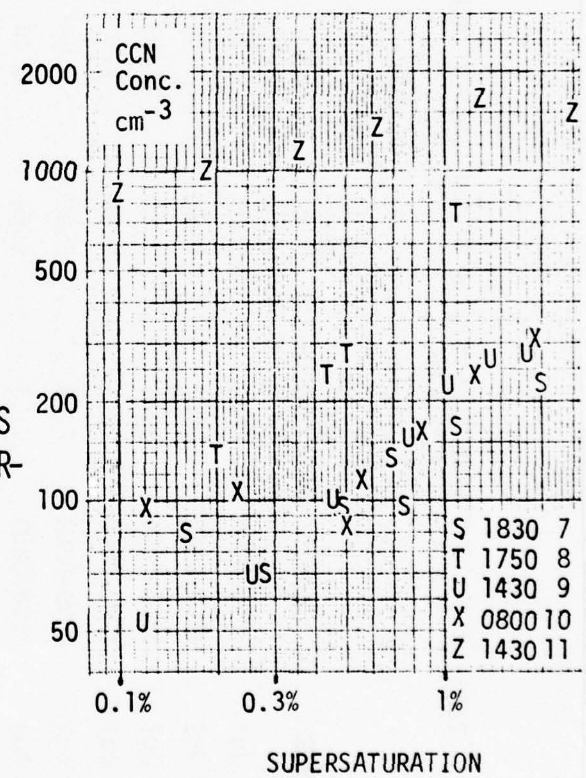


FIGURE A-4. OBSERVATIONS OF CLOUD NUCLEUS CONCENTRATIONS vs. SUPERSATURATION

Table A-2. CHEMICAL ANALYSIS OF HI-VOL AMBIENT AEROSOL SAMPLES COLLECTED OFF THE COAST OF NOVA SCOTIA

($\mu g/m^3$ of air)

Date	Time	SO_4^{--}	NH_4^+	Na	K	Ca	Mg	Al	Cl^{-1}
29 Jul	1200-2000	25.3	5.34	1.43	0.33	0.17	0.12	0.44	<.02
30 Jul	1100-1800	14.3	1.84	0.49	0.18	0.11	0.04	0.18	<.02
31 Jul	0000-0800	10.4	1.66	1.93	0.19	0.12	0.15	0.23	<.02
31 Jul	1200-2000	12.3	1.86	2.23	0.25	0.22	0.23	0.27	<.02
1 Aug	0000-0800	7.89	1.92	0.64	0.16	0.04	0.05	0.19	<.02
1 Aug	1200-2000	3.03	0.64	0.44	0.12	0.03	0.02	0.15	<.02
2 Aug	0000-0800	4.71	0.76	0.58	0.13	0.05	0.03	0.18	<.02
2 Aug	1030-1300 1530-1930	3.88	0.75	0.64	0.14	0.11	0.04	0.17	<.02
2-3 Aug	2000-0100 FG*	4.68	0.94	0.68	0.26	0.06	0.02	0.24	<.02
3 Aug	1230-1630	4.42	1.30	1.40	0.38	0.19	0.11	0.38	<.02
4 Aug	0930-1530 FG	3.49	0.55	1.51	0.25	0.07	0.10	0.25	<.02
5 Aug	0000-0800 FG	2.90	0.46	0.63	0.13	0.04	0.04	0.16	<.02
5 Aug	1200-2000 FG	6.65	0.78	1.80	0.17	0.15	0.10	0.34	<.02
6 Aug	0000-0800 FG	2.46	0.44	0.47	0.15	0.10	0.04	0.23	<.02
6 Aug	1200-2020	3.25	0.54	0.42	0.13	0.03	0.02	0.19	<.02
7 Aug	1200-2000 FG	5.45	0.49	1.16	0.18	0.22	0.11	0.32	<.02
8 Aug	0000-0800 FG	3.30	0.48	0.41	0.15	0.03	0.02	0.12	<.02
8 Aug	1200-2000	3.08	0.41	1.20	0.14	0.09	0.06	0.12	<.02

*FG indicates fog was present during a portion of the sampling period.

Table A-3. CHEMICAL ANALYSIS OF FOG WATER SAMPLES COLLECTED OFF THE COAST OF NOVA SCOTIA

(μg/ml of fog water)

Fog	Date	SO_4^{--}	NH_4^+	Na	K	Ca	Mg	Al	Cl^{-1}
2AB	2 Aug	22.5	0.52	28.5	2.03	1.38	0.94	<1	8.4
2C	3 Aug	21.0	1.20	14.0	0.83	0.68	1.52	<1	5.5
4A	3 Aug	24.0	0.85	36.0	1.85	1.22	3.62	<1	16.0
4B	4 Aug	17.3	1.70	25.0	1.53	0.68	3.28	<1	11.0
4CD	4 Aug	5.3	0.05	32.9	2.3	0.99	1.18	<1	3.3
6	5 Aug	9.0	1.30	26.1	1.5	0.80	0.55	<1	0.5
7	6 Aug	16.5	0.65	27.3	2.7	0.99	0.96	<1	0.4
8	6 Aug	10.5	0.43	23.7	2.1	0.82	0.54	<1	0.2
9	7 Aug	9.0	0.25	20.0	2.1	0.87	0.52	<1	0.2
10	7-8 Aug	8.0	0.28	21.8	2.3	0.90	0.60	<1	0.1
11	8-9 Aug	5.0	0.06	20.4	1.5	0.77	0.63	<1	0.3
12	9 Aug	2.3	0.21	17.6	1.6	0.65	0.36	<1	0.2
13	10 Aug	3.0	0.08	23.4	2.6	1.07	0.64	<1	0.6
14	10 Aug	2.5	0.20	20.0	1.0	0.59	0.53	<1	0.7

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

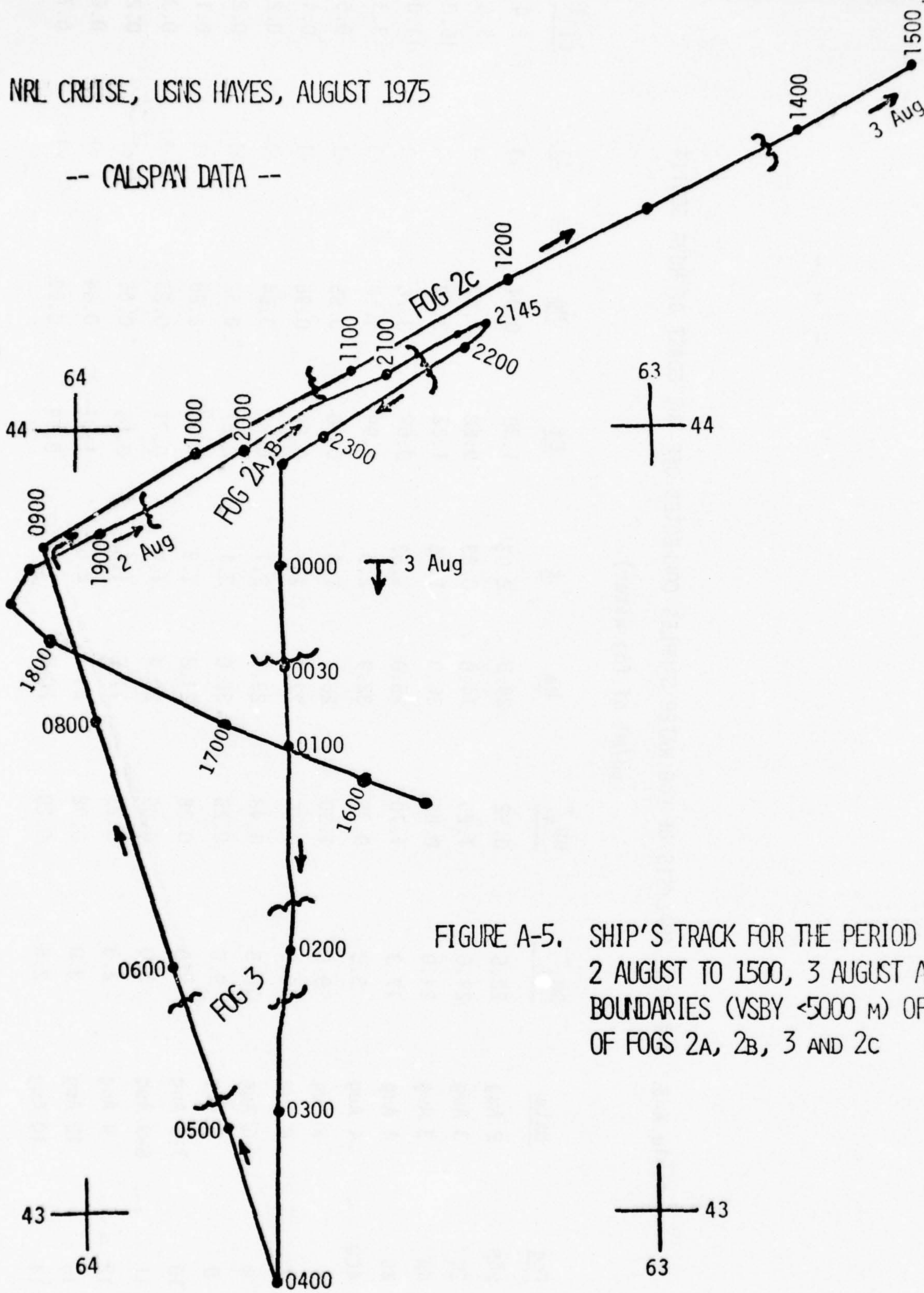
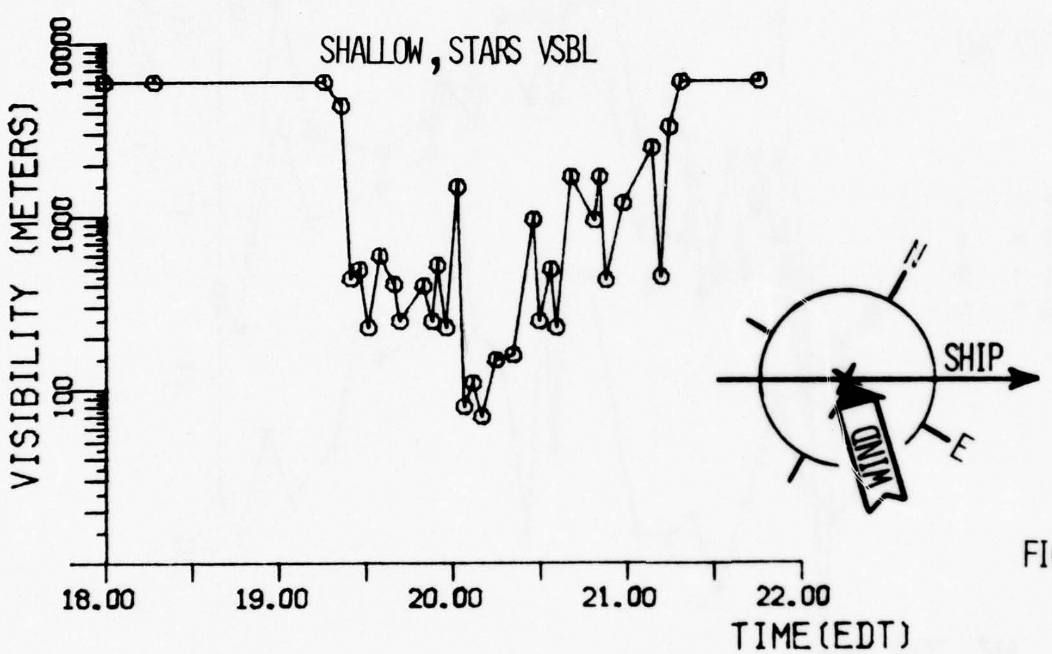


FIGURE A-5. SHIP'S TRACK FOR THE PERIOD 1800, 2 AUGUST TO 1500, 3 AUGUST AND BOUNDARIES (VSBY <5000 M) OF OF FOGS 2A, 2B, 3 AND 2C

FØG NO. 2A   2AUG 75



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-6. VISIBILITY vs. TIME -- FOG 2A, 2 AUGUST 1975

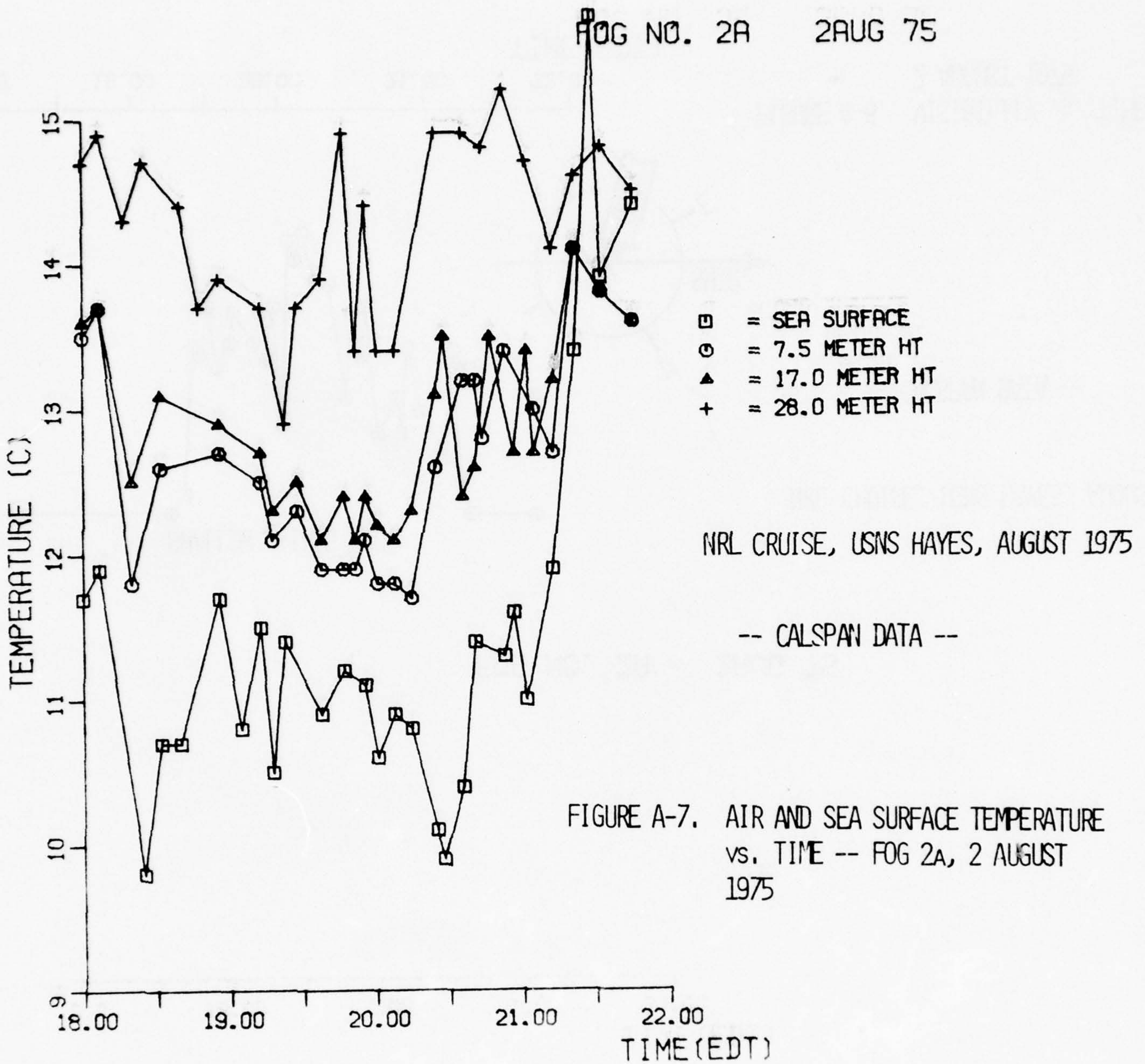


FIGURE A-7. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 2A, 2 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FOG NO. 2A 2AUG 75

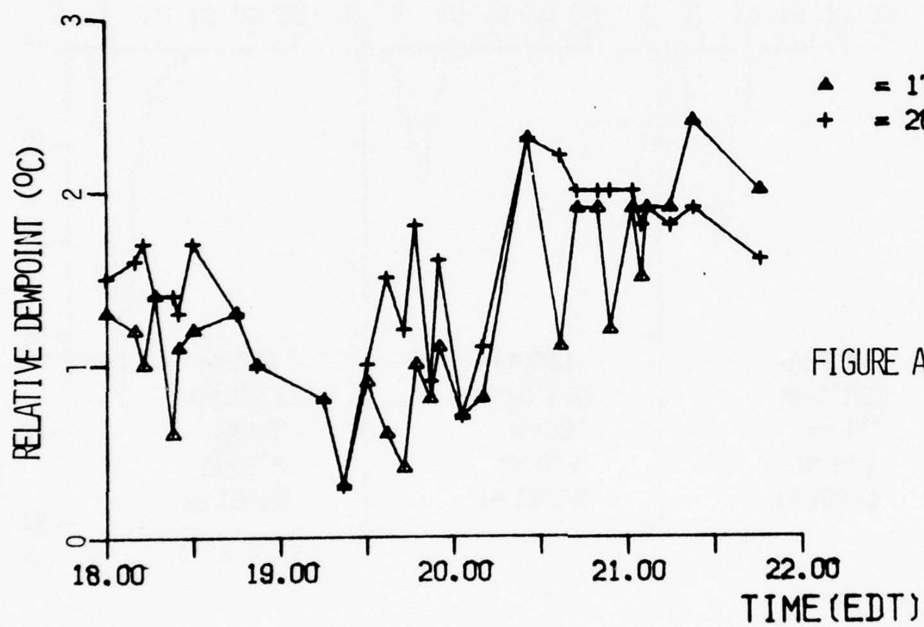
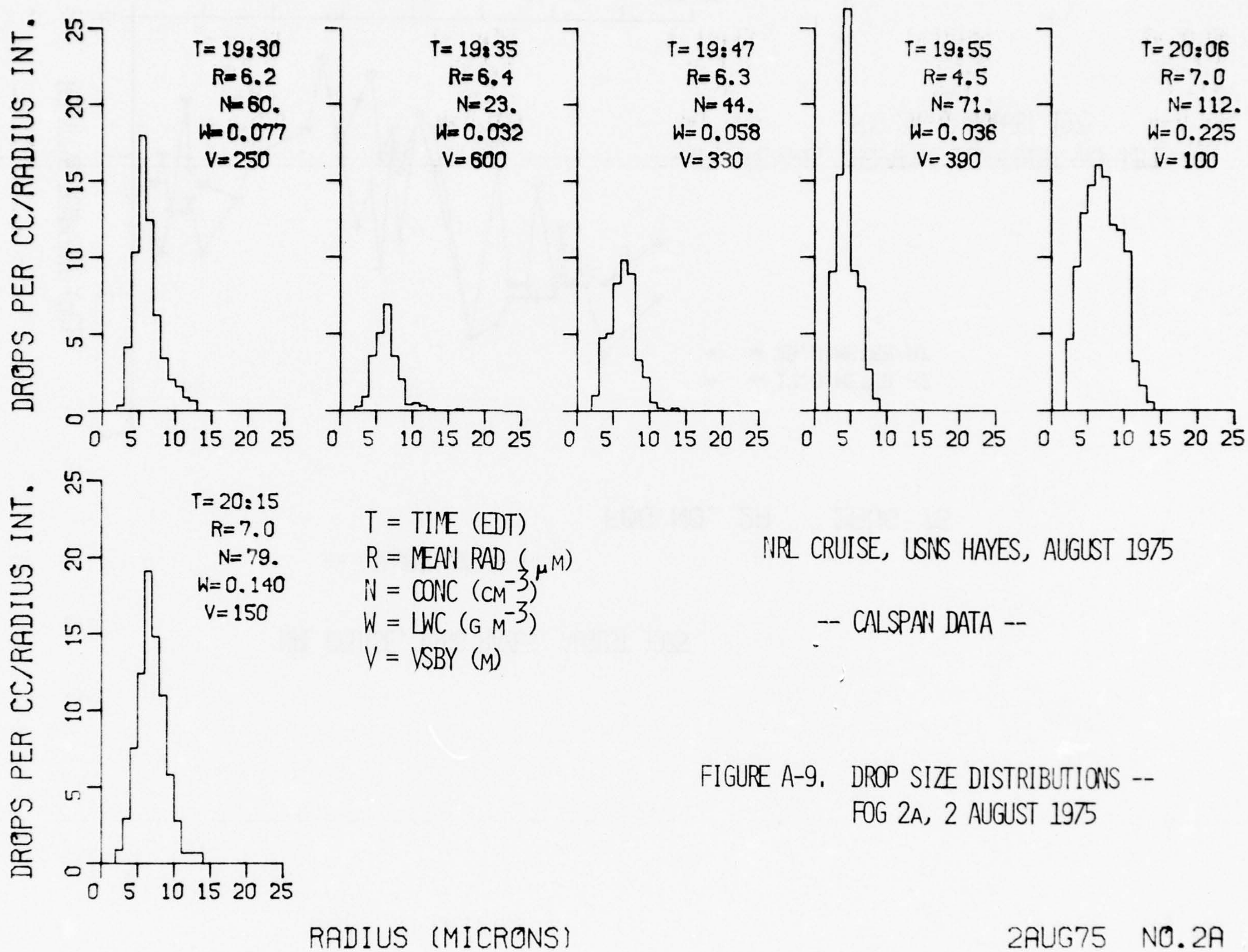


FIGURE A-8. RELATIVE DEW POINT vs. TIME -- FOG 2A, 2 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-9. DROP SIZE DISTRIBUTIONS -- FOG 2A, 2 AUGUST 1975

2AUG75 NO.2A

FOG NO. 2B   2-3AUG. 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

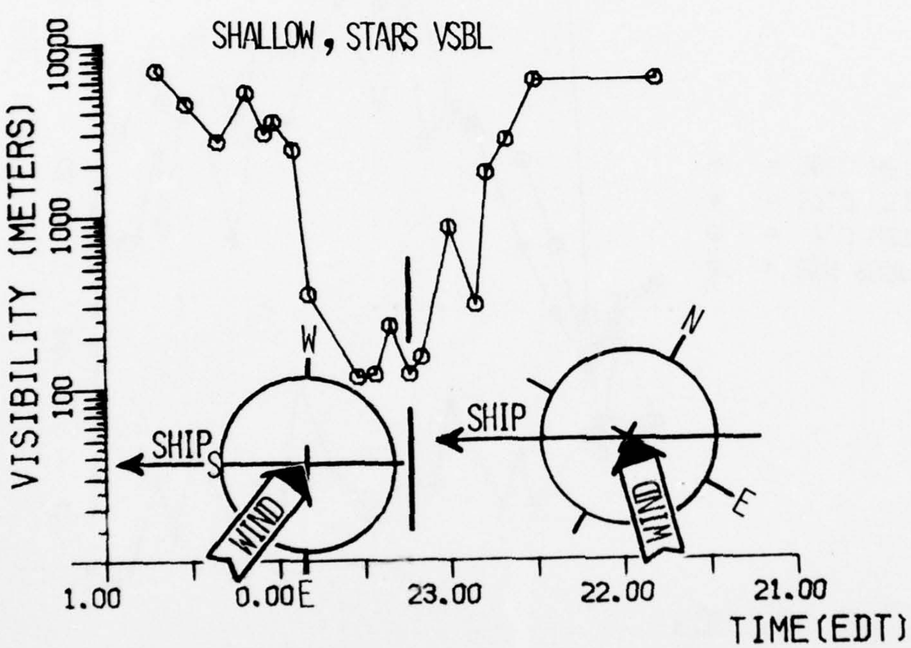
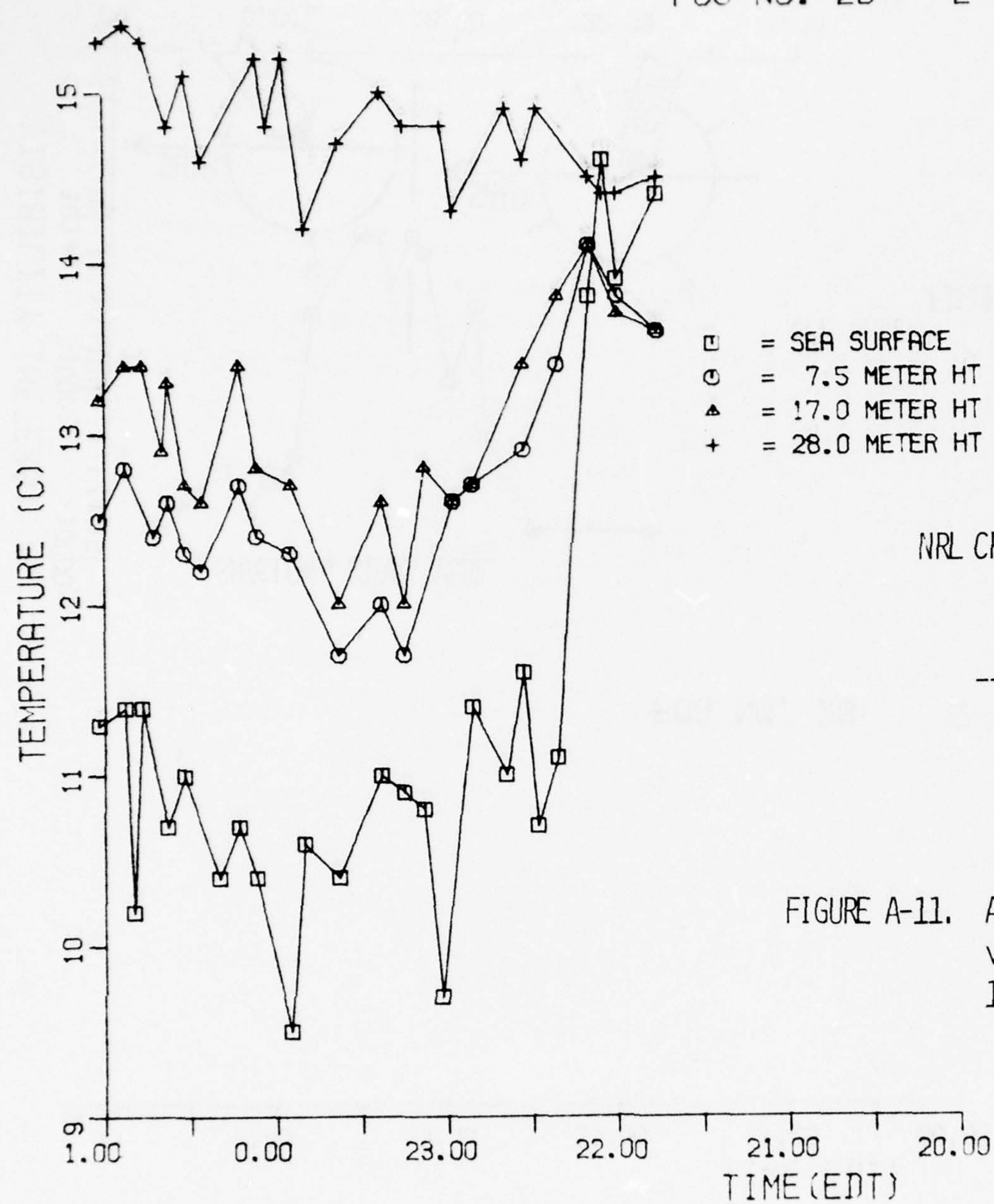


FIGURE A-10. VISIBILITY vs. TIME -- FOG 2B, 2-3 AUGUST 1975

FØG NØ. 2B   2-3 AUG '75



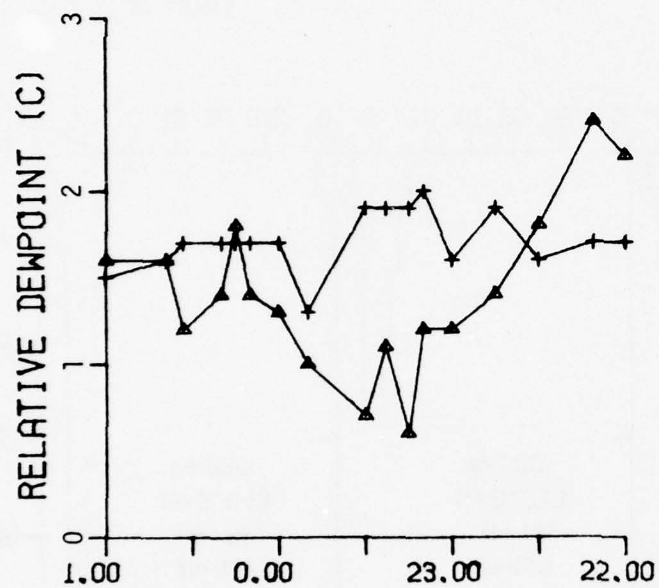
NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-11. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 2B, 2-3 AUGUST 1975

FOG NO. 2B 2-3AUG 1975

▲ = 17.0 METER HT
\+ = 28.0 METER HT

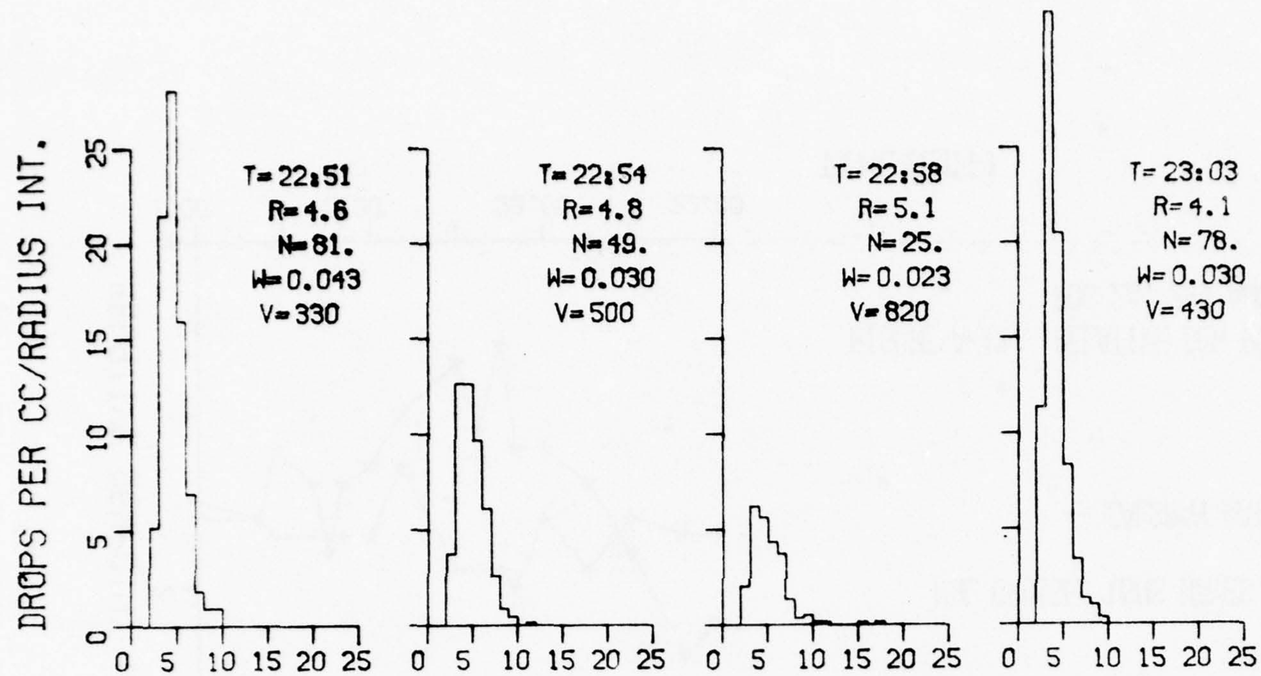


TIME (EDT)

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-12. RELATIVE DEW POINT vs. TIME -- FOG 2B, 2-3 AUGUST 1975



T = TIME (EDT)
R = MEAN RAD (μM)
N = CONC (CM^{-3})
W = LWC ($G\ M^{-3}$)
V = VSBY (M)

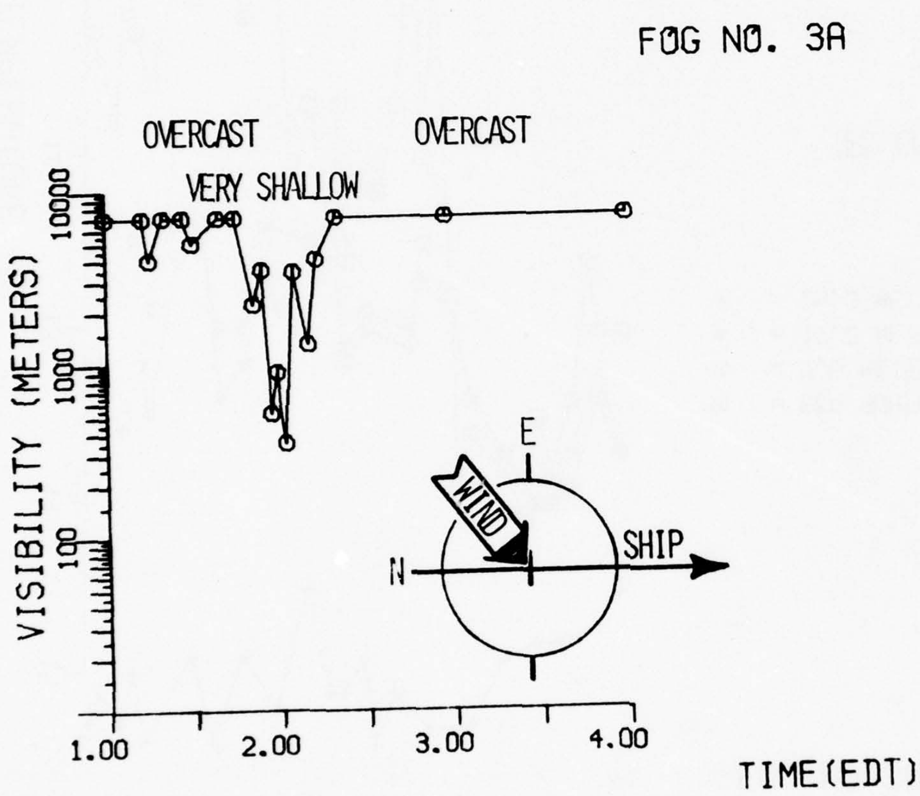
NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-13. DROP SIZE DISTRIBUTIONS -- FOG 2B, 2-3 AUGUST 1975

RADIUS (MICRONS)

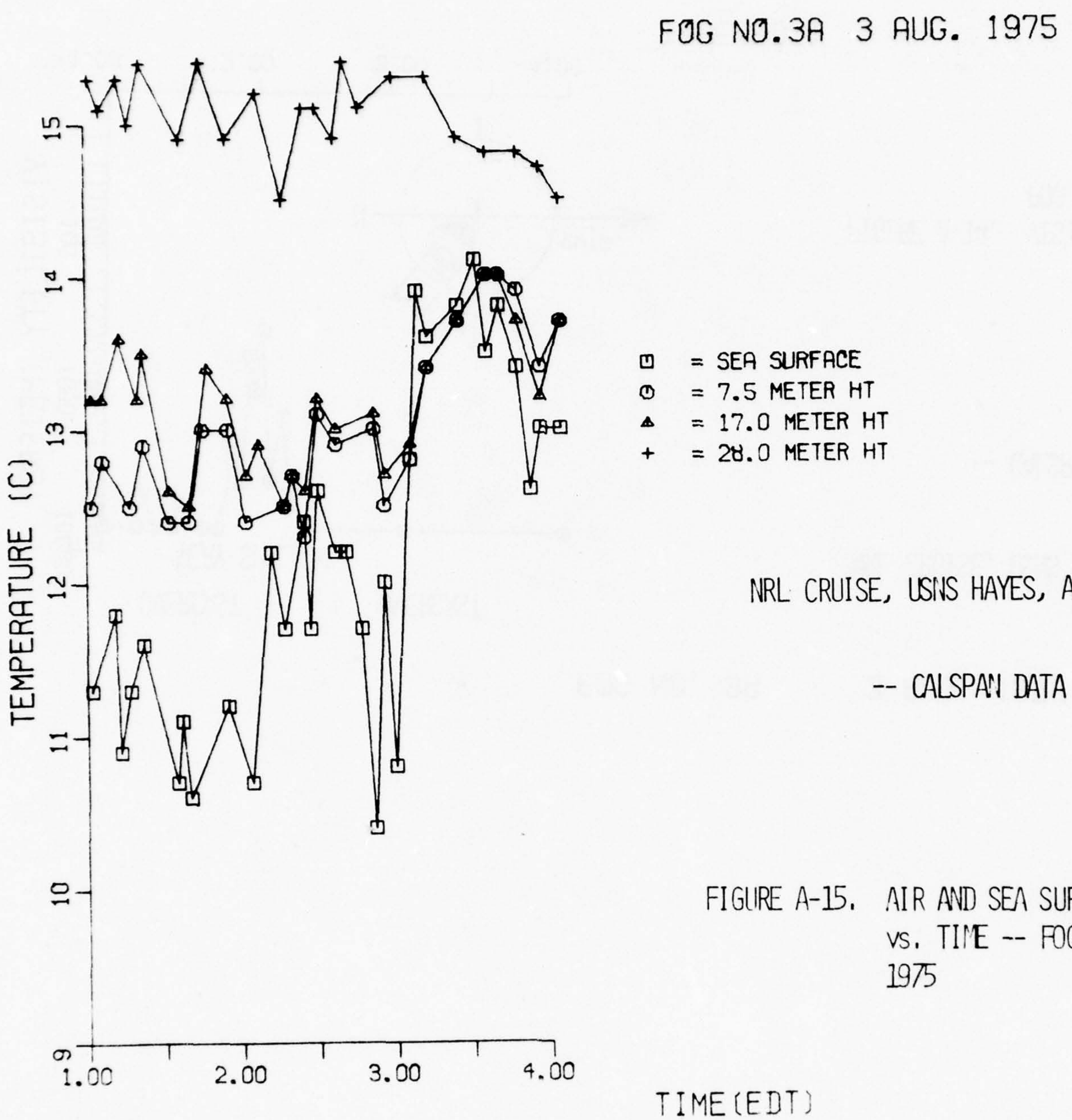
2AUG75 NO.2B



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-14. VISIBILITY vs. TIME -- FOG 3A, 3 AUGUST 1975

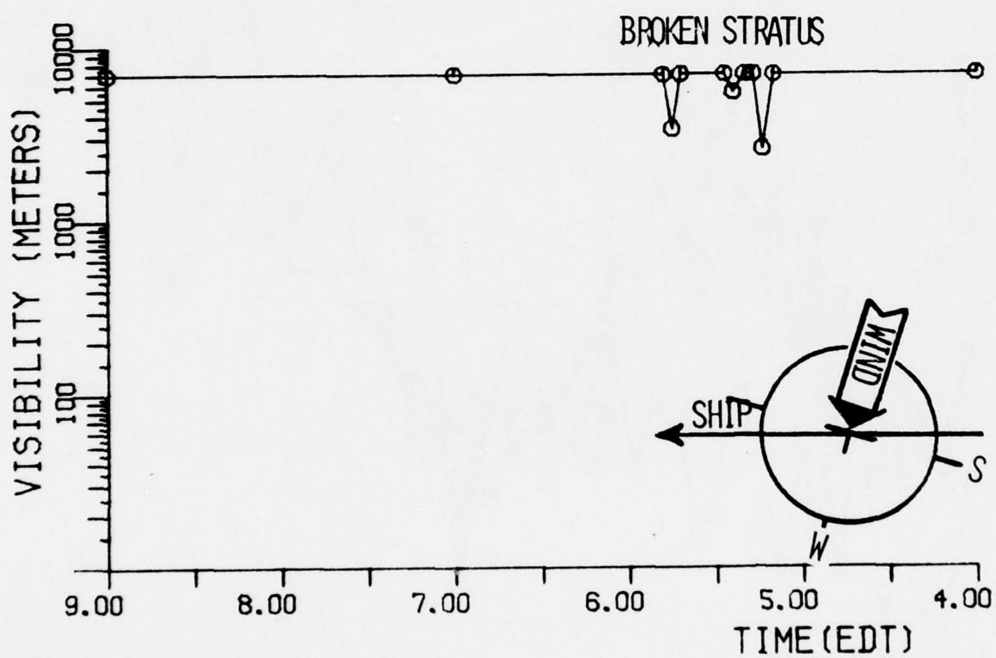


NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-15. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 3A, 3 AUGUST 1975

FOG NO.3B 3 AUG. 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-16. VISIBILITY vs. TIME -- FOG 3B, 3 AUGUST 1975

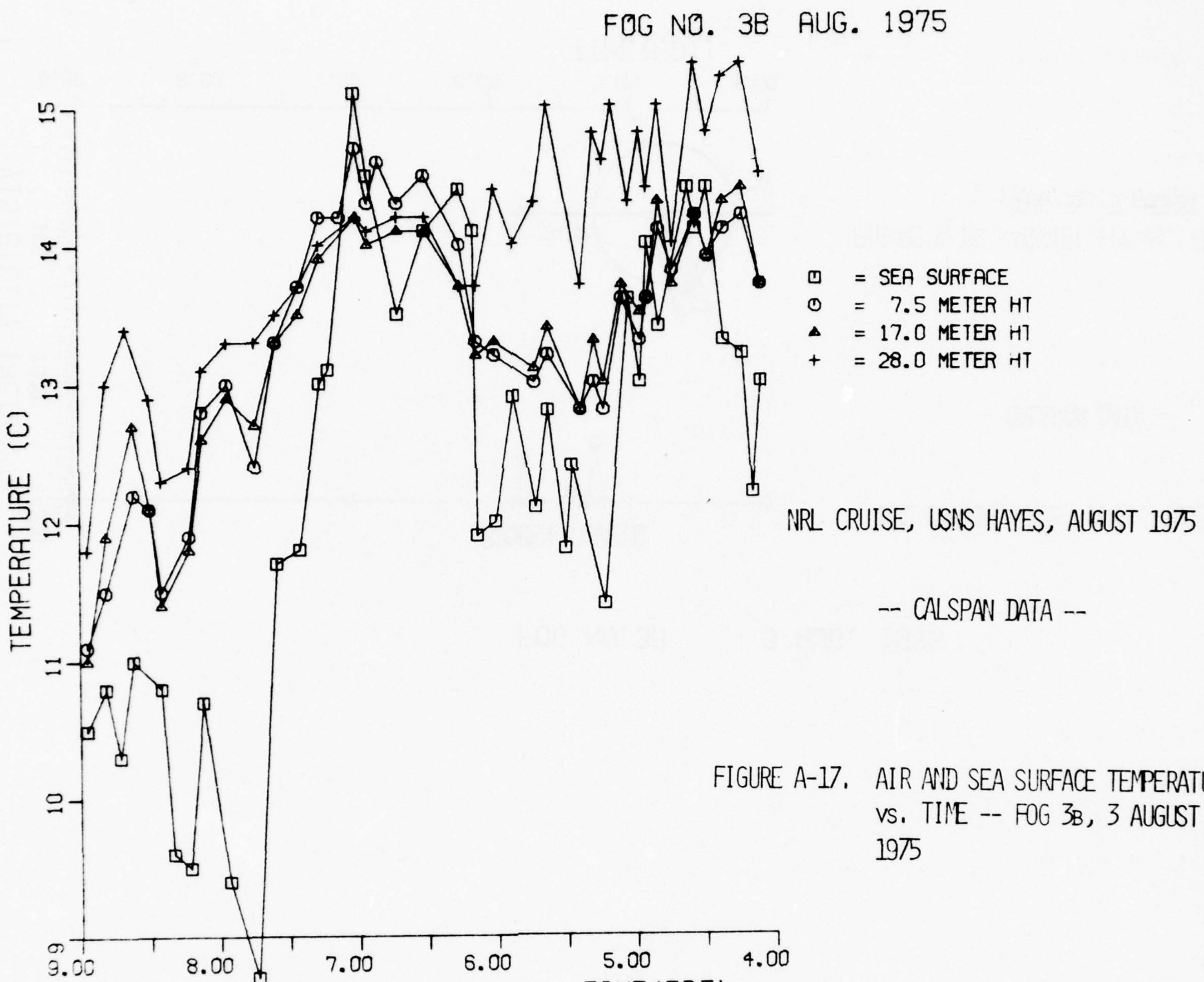
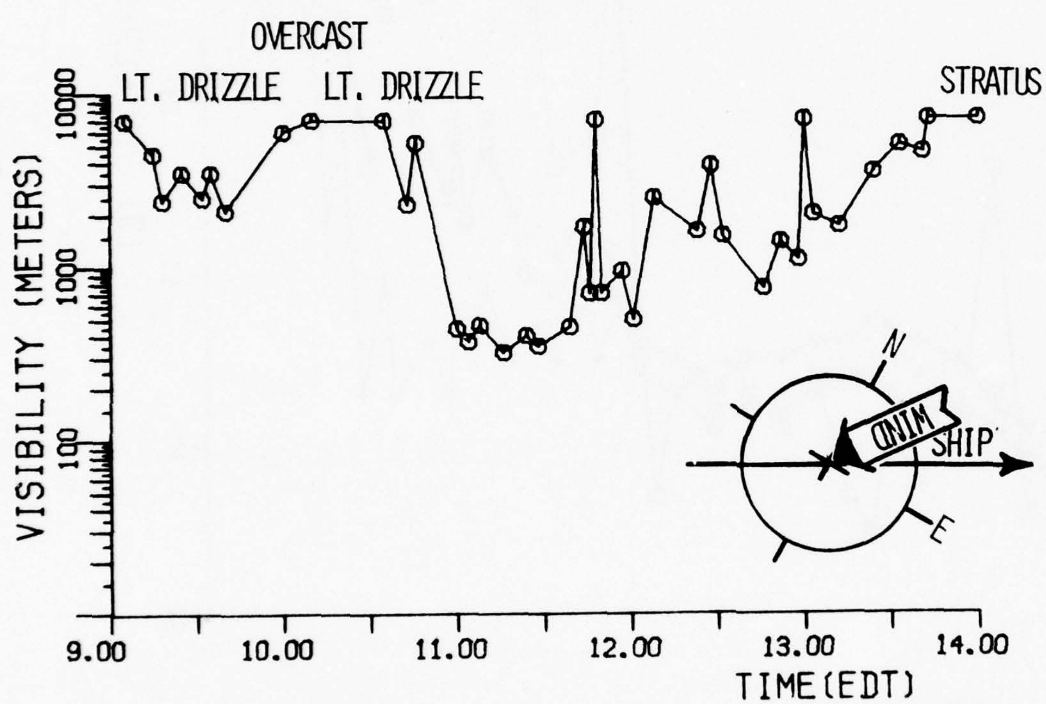


FIGURE A-17. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 3B, 3 AUGUST 1975

FOG NO. 2C   3 AUG. 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-18. VISIBILITY vs. TIME -- FOG 2c, 3 AUGUST 1975

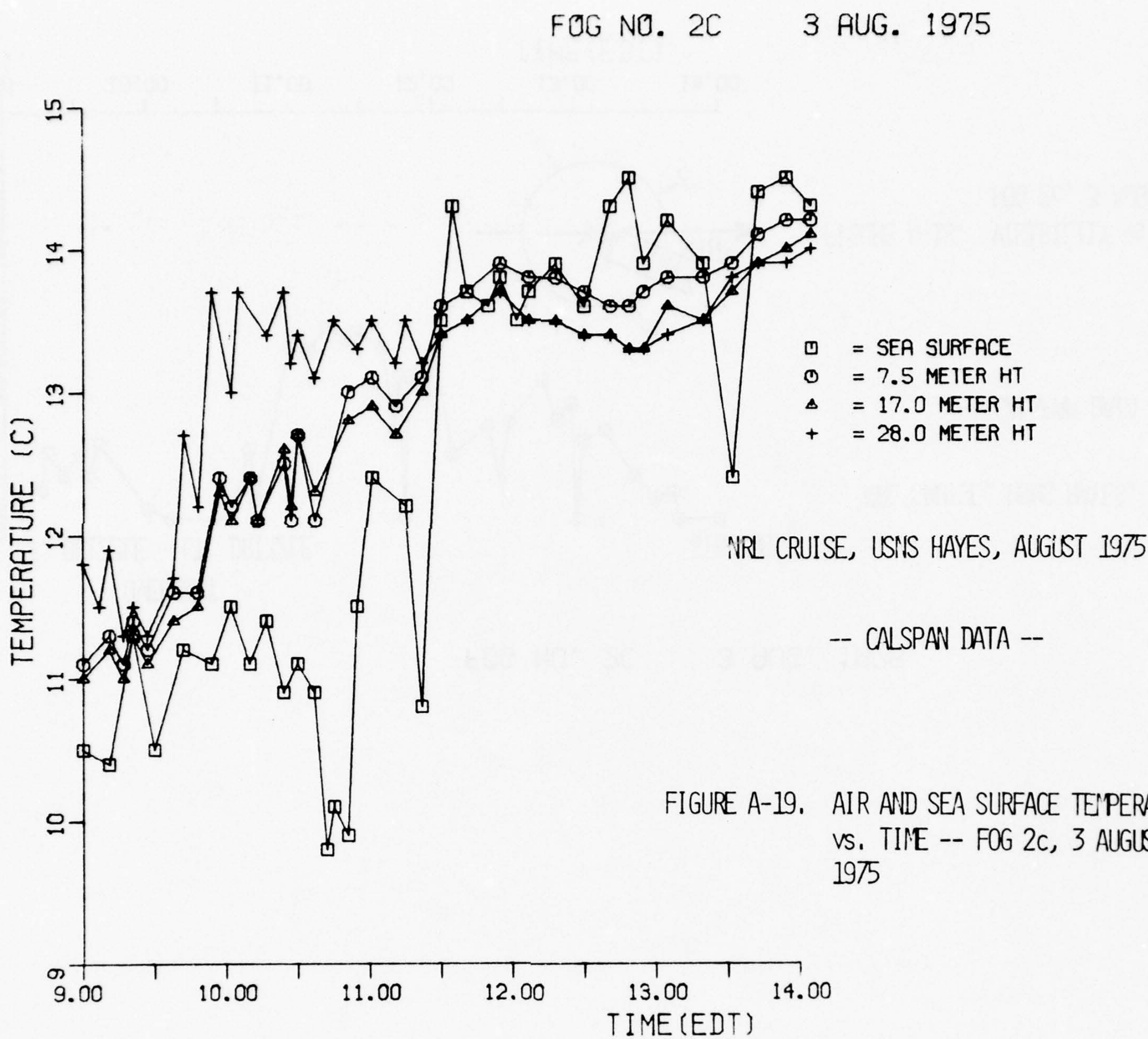


FIGURE A-19. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 2c, 3 AUGUST 1975

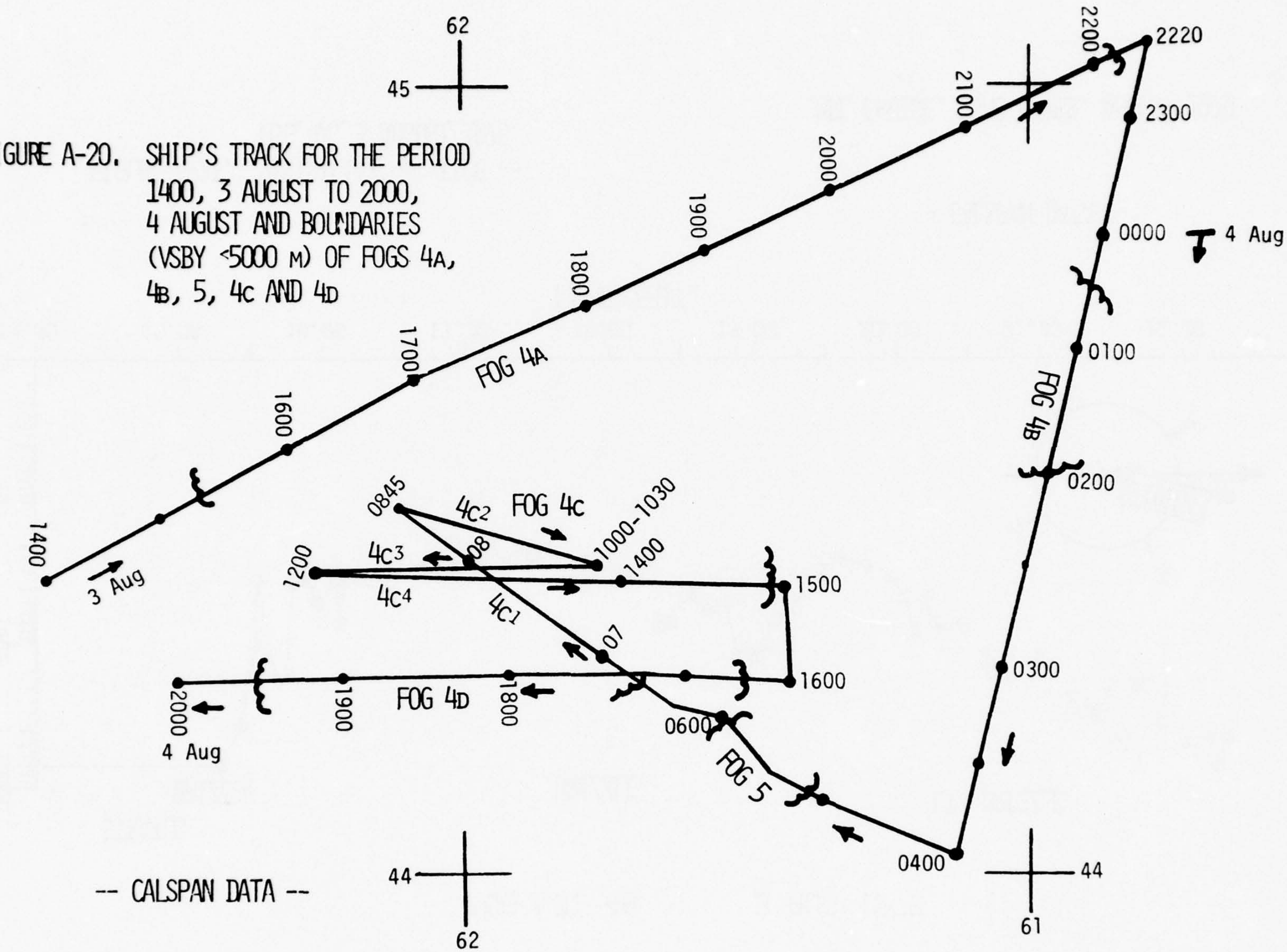


FIGURE A-20. SHIP'S TRACK FOR THE PERIOD 1400, 3 AUGUST TO 2000, 4 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOGS 4A, 4B, 5, 4C AND 4D

-- CALSPAN DATA --

NRL CRUISE, USNS HAYES, AUGUST 1975

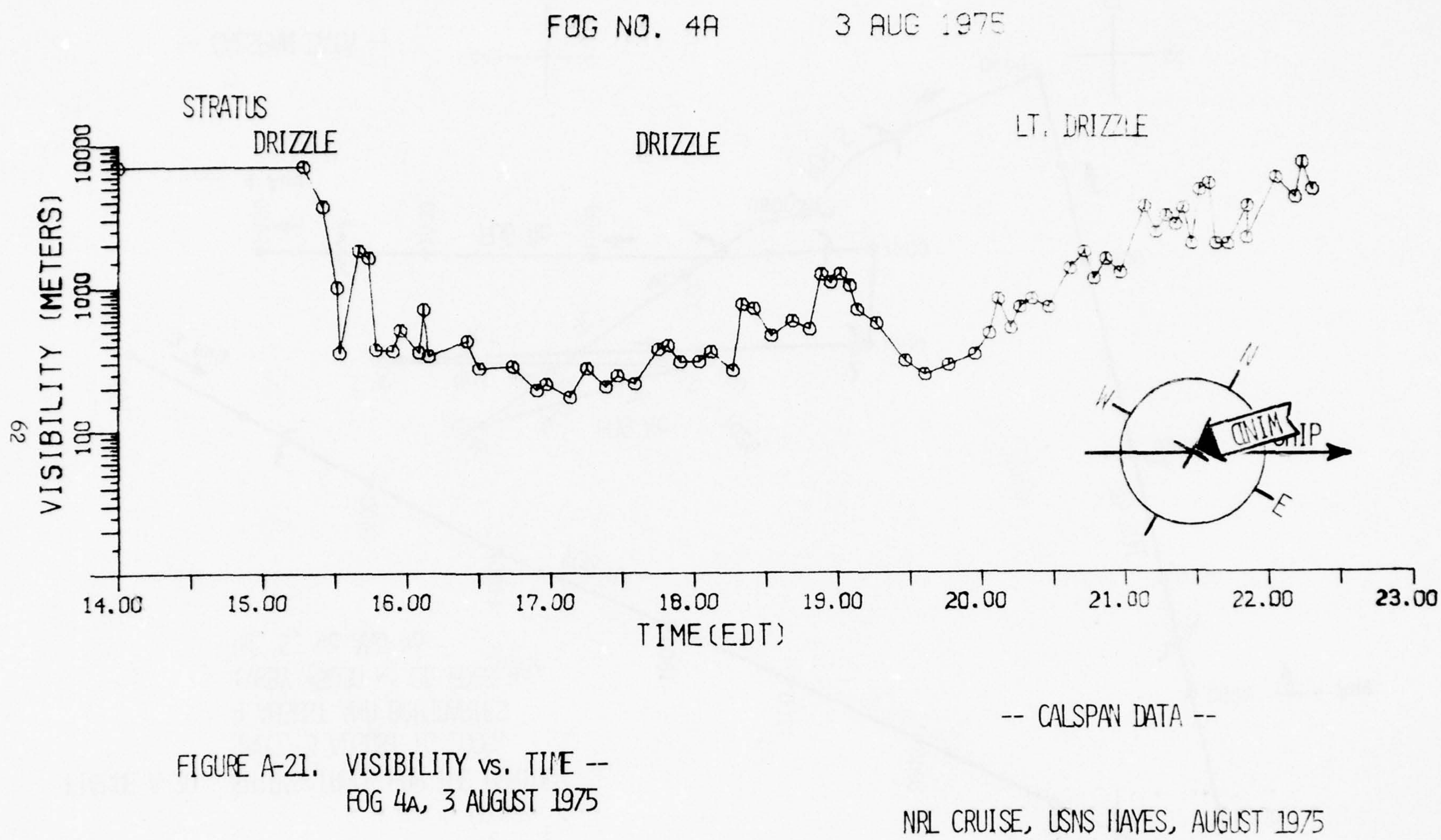
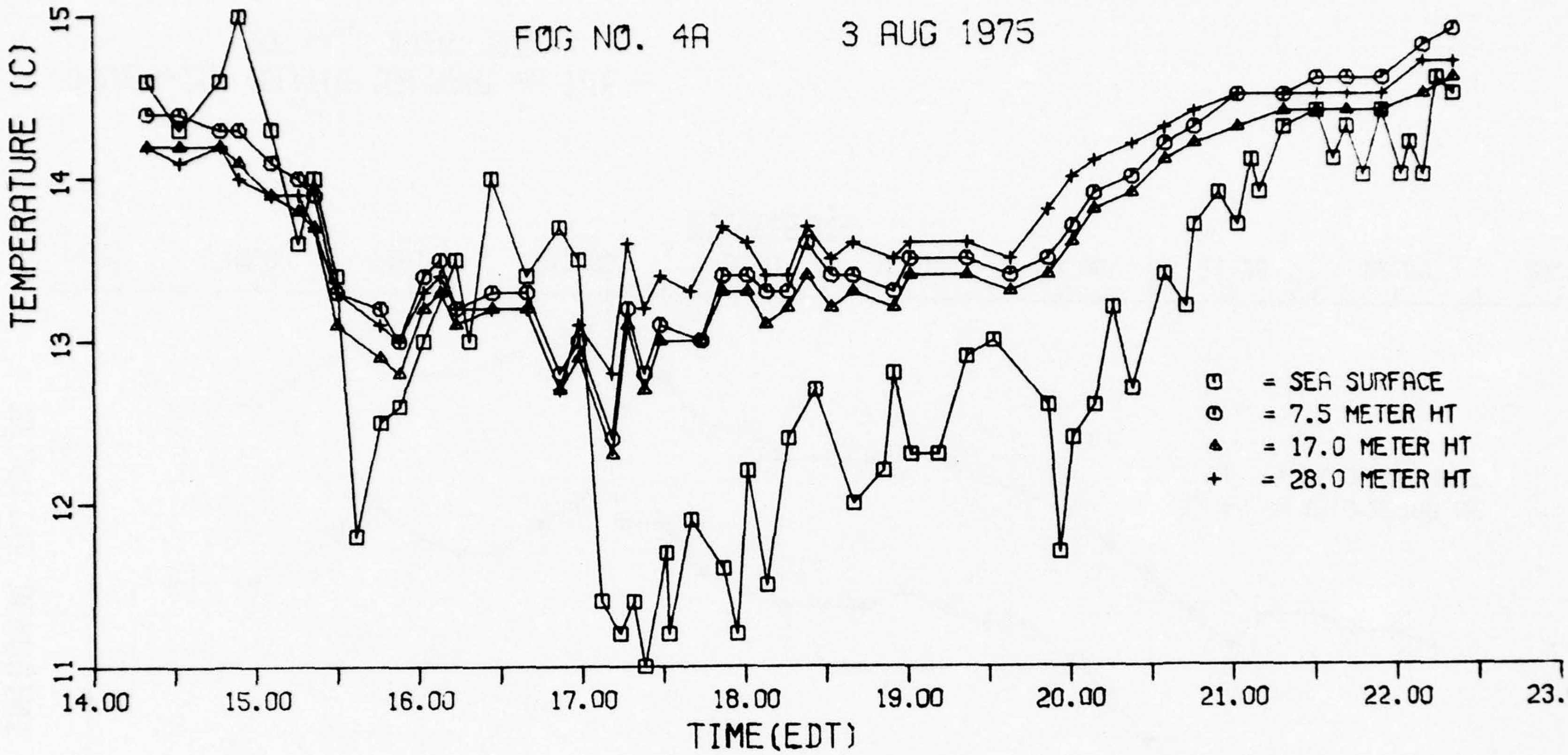


FIGURE A-21. VISIBILITY vs. TIME --
FOG 4A, 3 AUGUST 1975



-- CALSPAN DATA --

FIGURE A-22. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 4A, 3 AUGUST 1975.

NRL CRUISE, USNS HAYES, AUGUST 1975

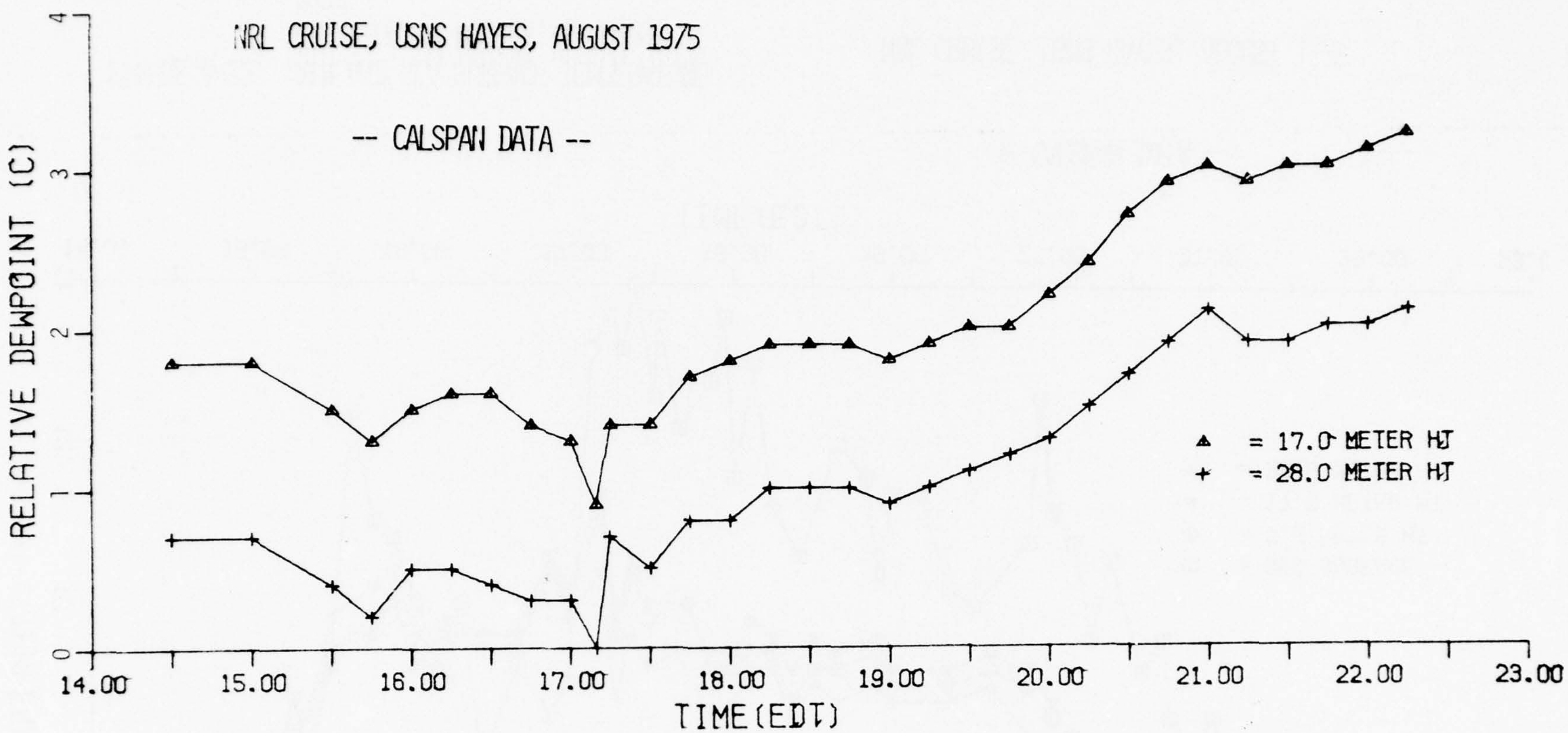
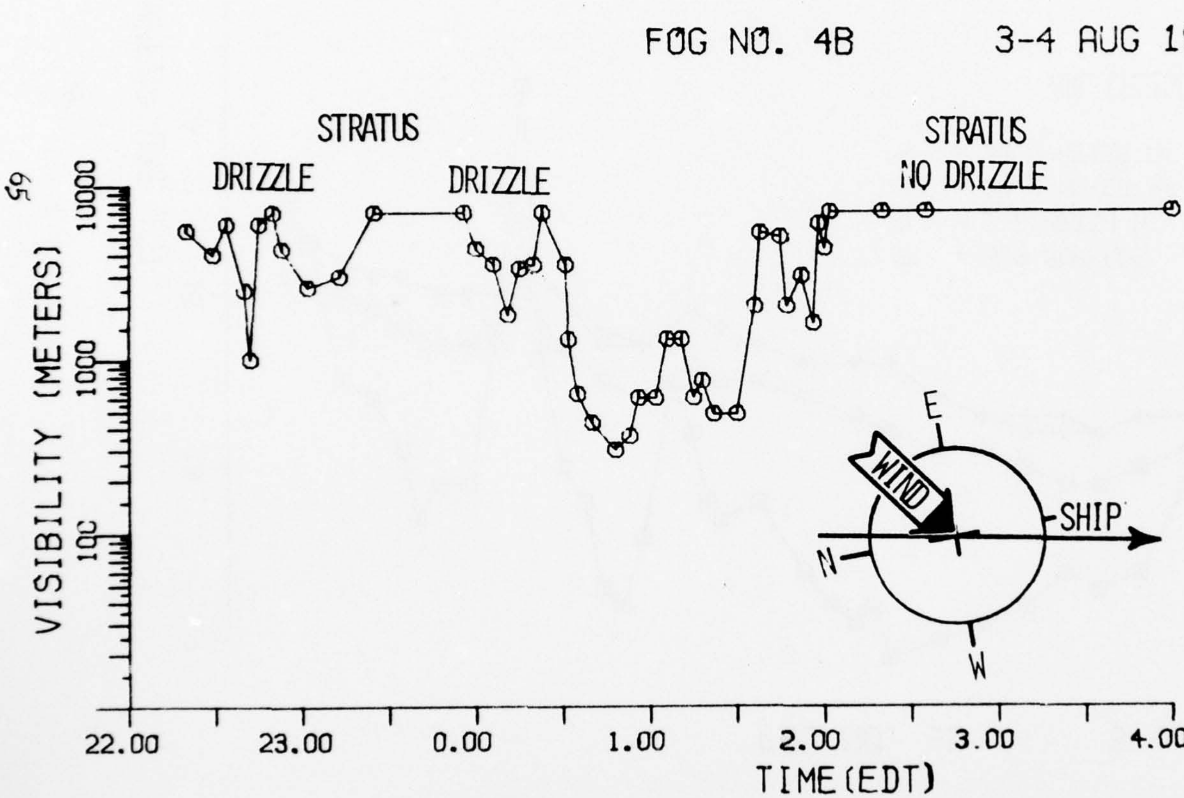


FIGURE A-23. RELATIVE DEW POINT vs. TIME --
FOG 4A, 3 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-24. VISIBILITY vs. TIME -- FOG 4B, 3-4 AUGUST 197

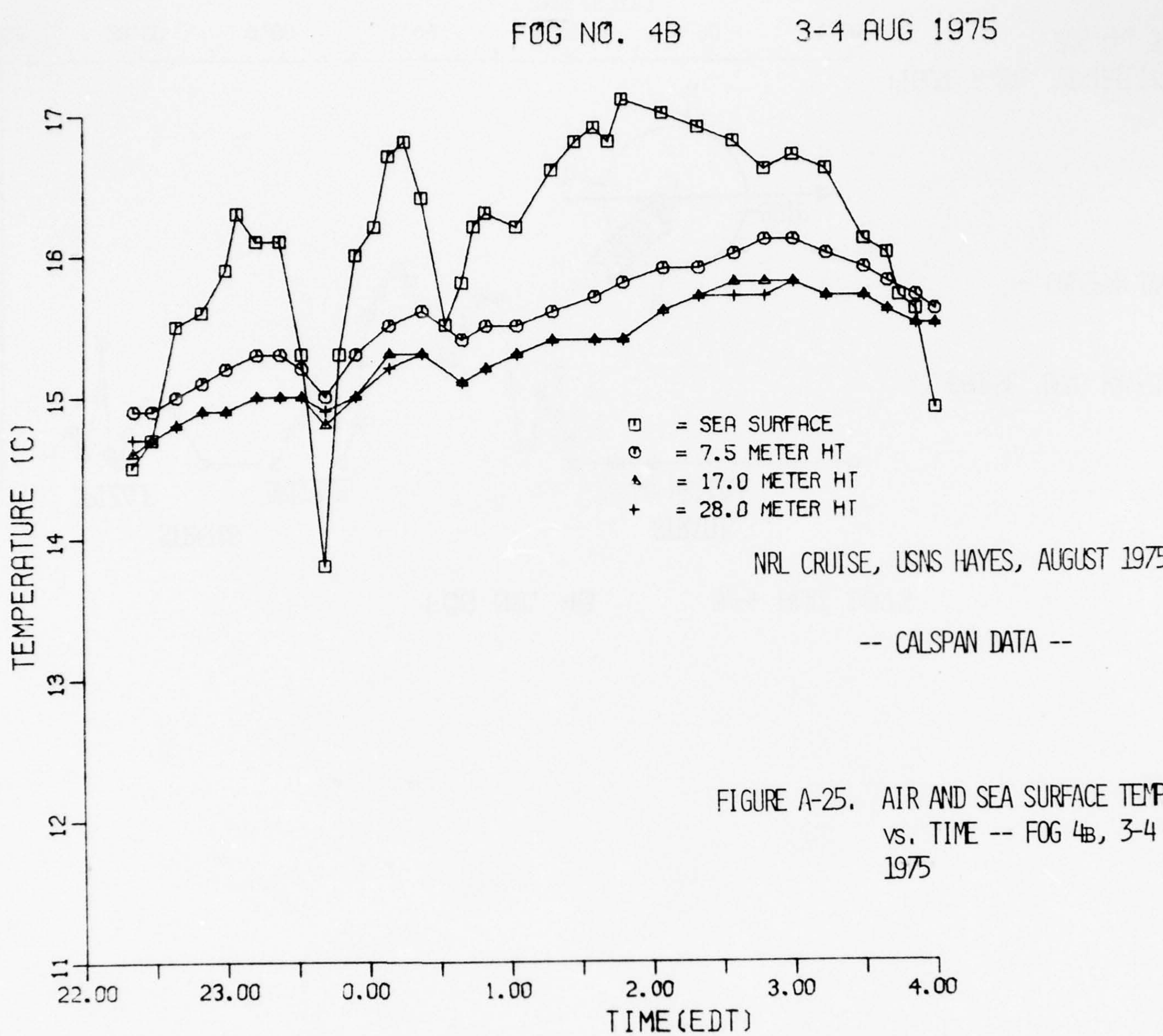


FIGURE A-25. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 4B, 3-4 AUGUST 1975

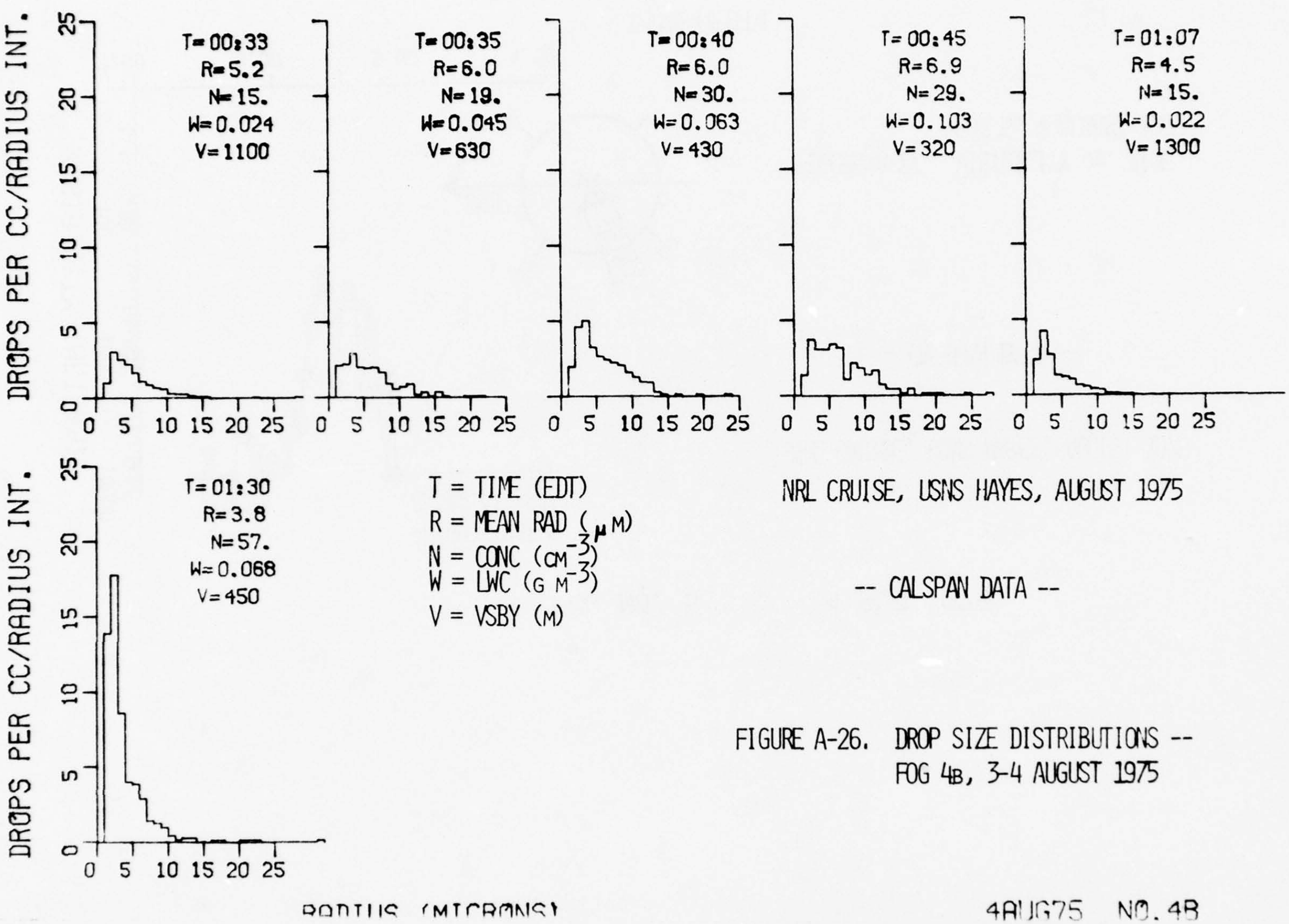
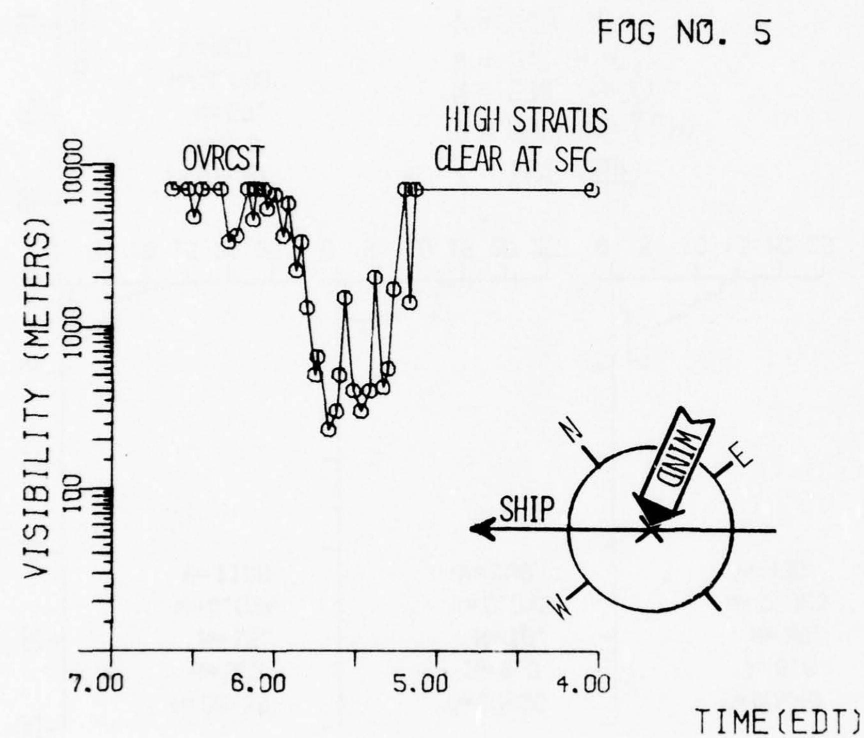


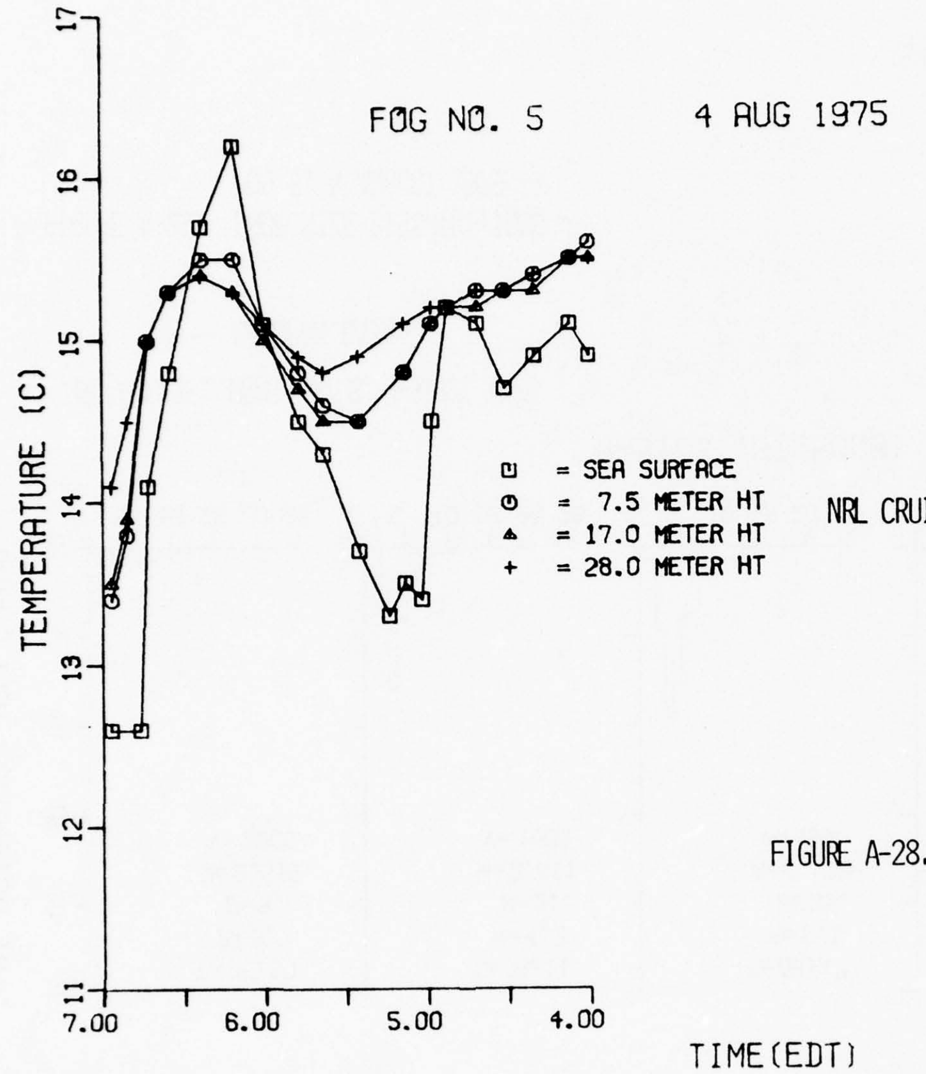
FIGURE A-26. DROP SIZE DISTRIBUTIONS --
FOG 4B, 3-4 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

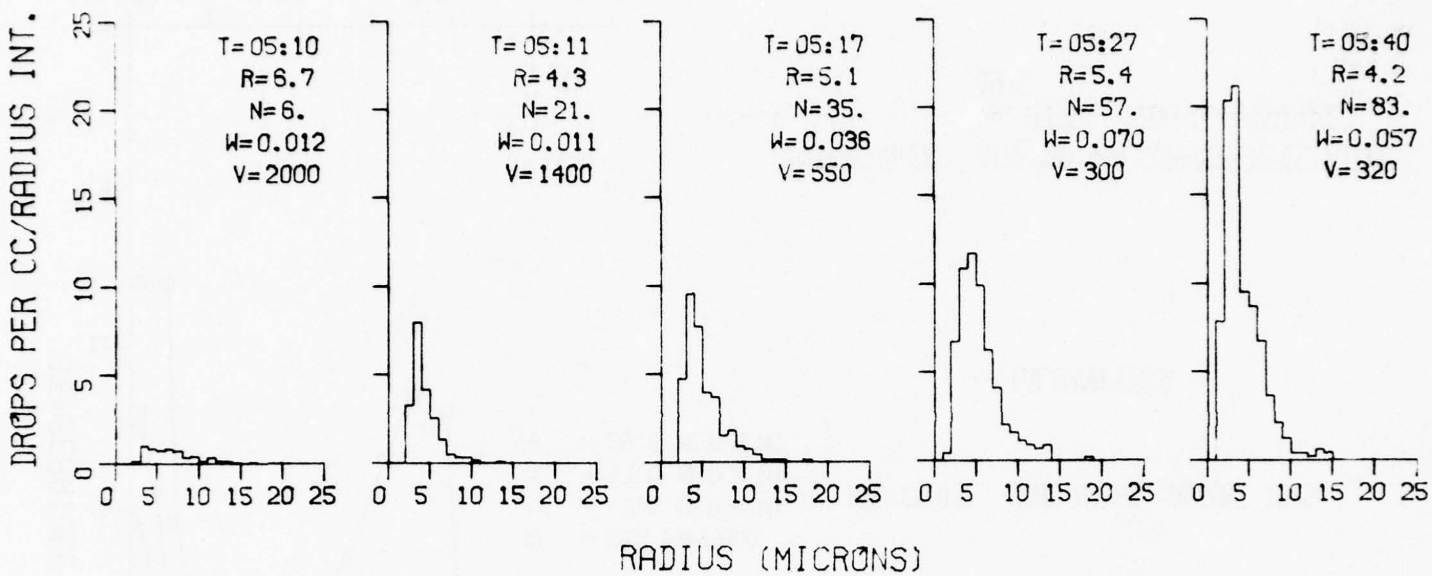
FIGURE A-27. VISIBILITY vs. TIME -- FOG 5, 4 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-28. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 5, 4 AUGUST 1975



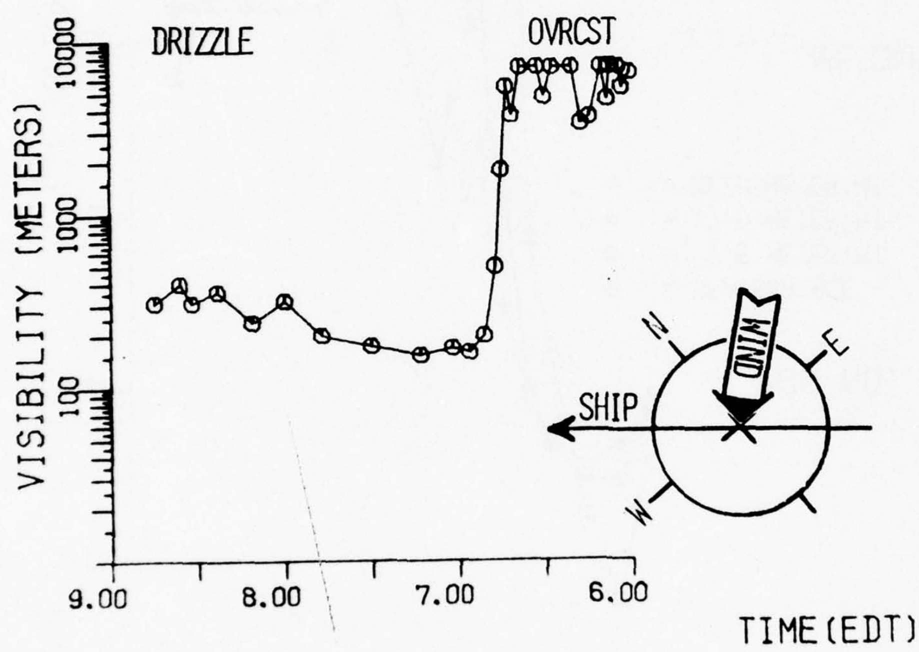
NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

T = TIME (EDT)
R = MEAN RAD (μM)
N = CONC (CM^{-3})
W = LWC ($G\ M^{-3}$)
V = VSBY (M)

FIGURE A-29. DROP SIZE DISTRIBUTIONS --
FOG 5, 4 AUGUST 1975

FOG NO. 4C1 4 AUG 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-30. VISIBILITY vs. TIME -- FOG $4C_1$, 4 AUGUST 1975

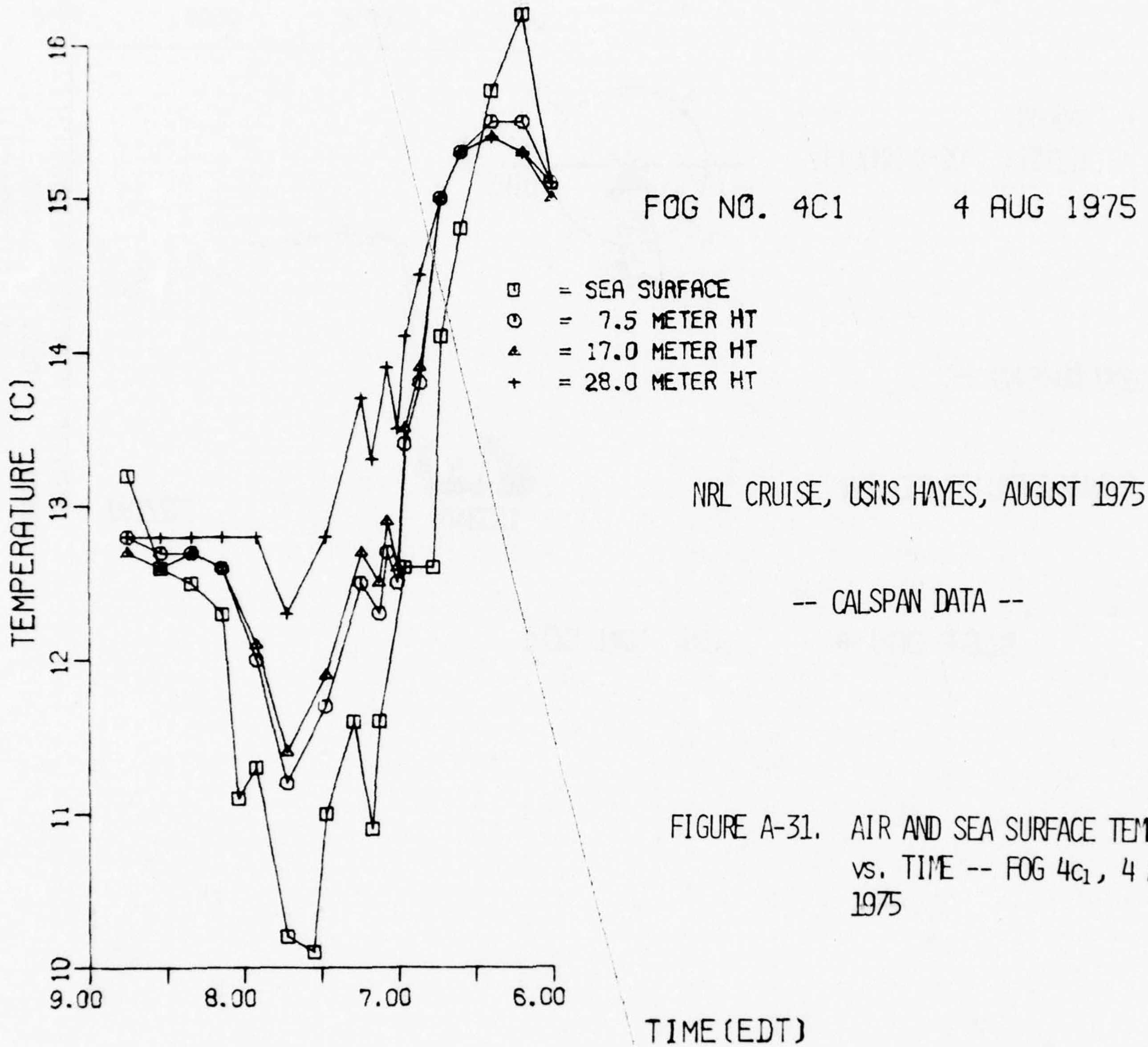


FIGURE A-31. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG $4C_1$, 4 AUGUST 1975

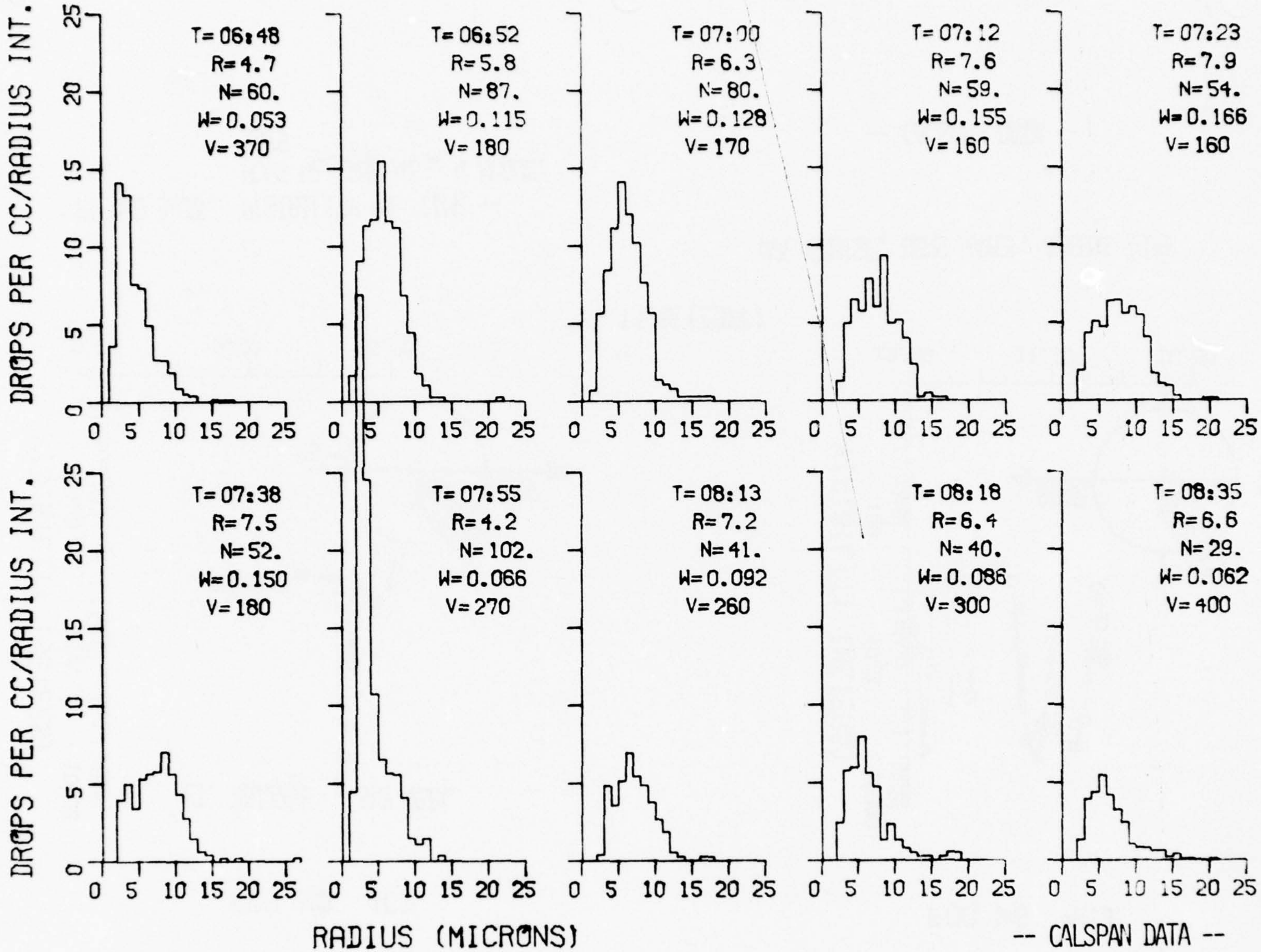


FIGURE A-32. DROP SIZE DISTRIBUTIONS -- FOG $4c_1$, 4 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 197

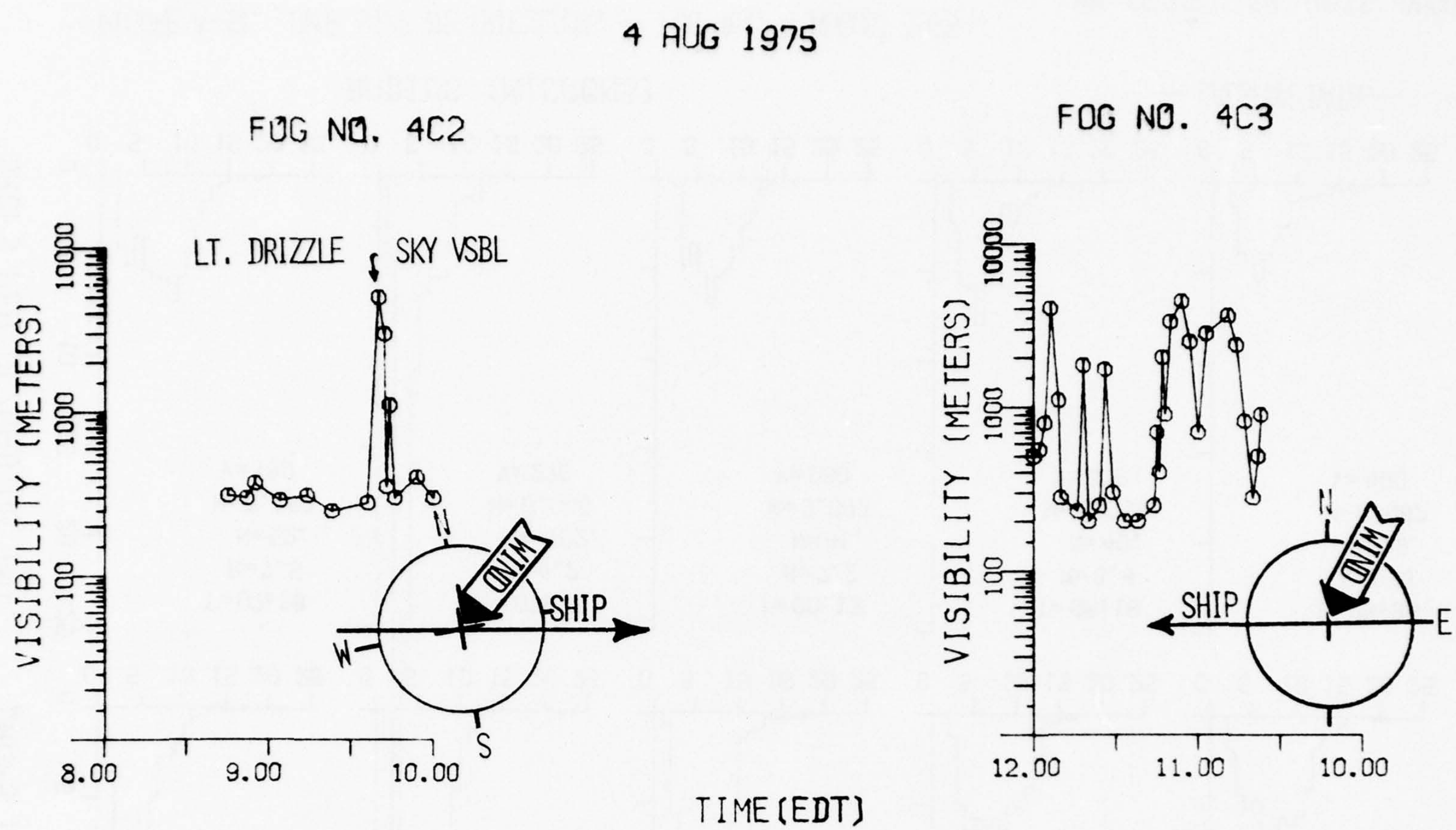


FIGURE A-33. VISIBILITY VS. TIME -- FOGS $4c_2$ AND $4c_3$, 4 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

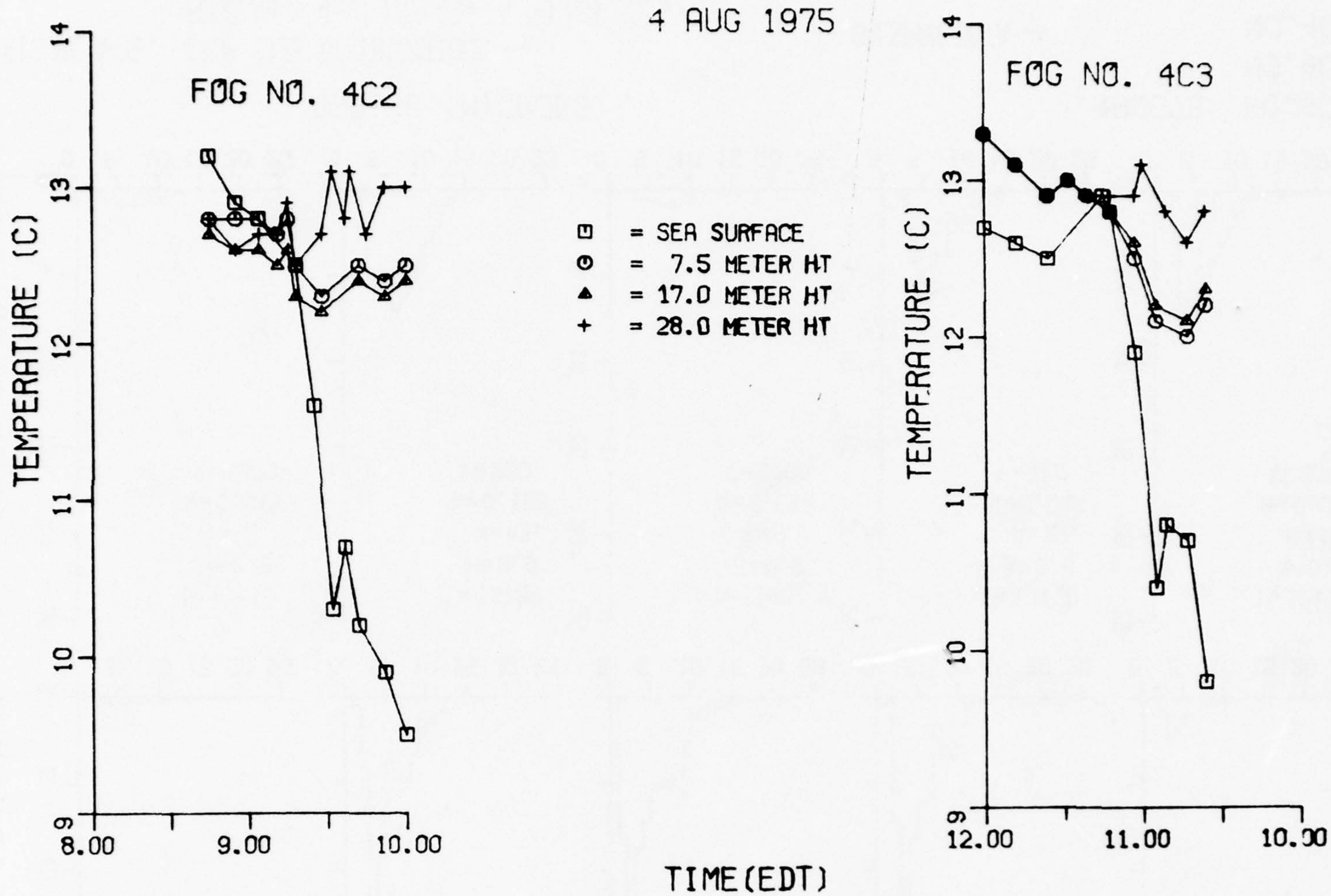


FIGURE A-34. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOGS $4c_2$ AND $4c_3$, 4 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

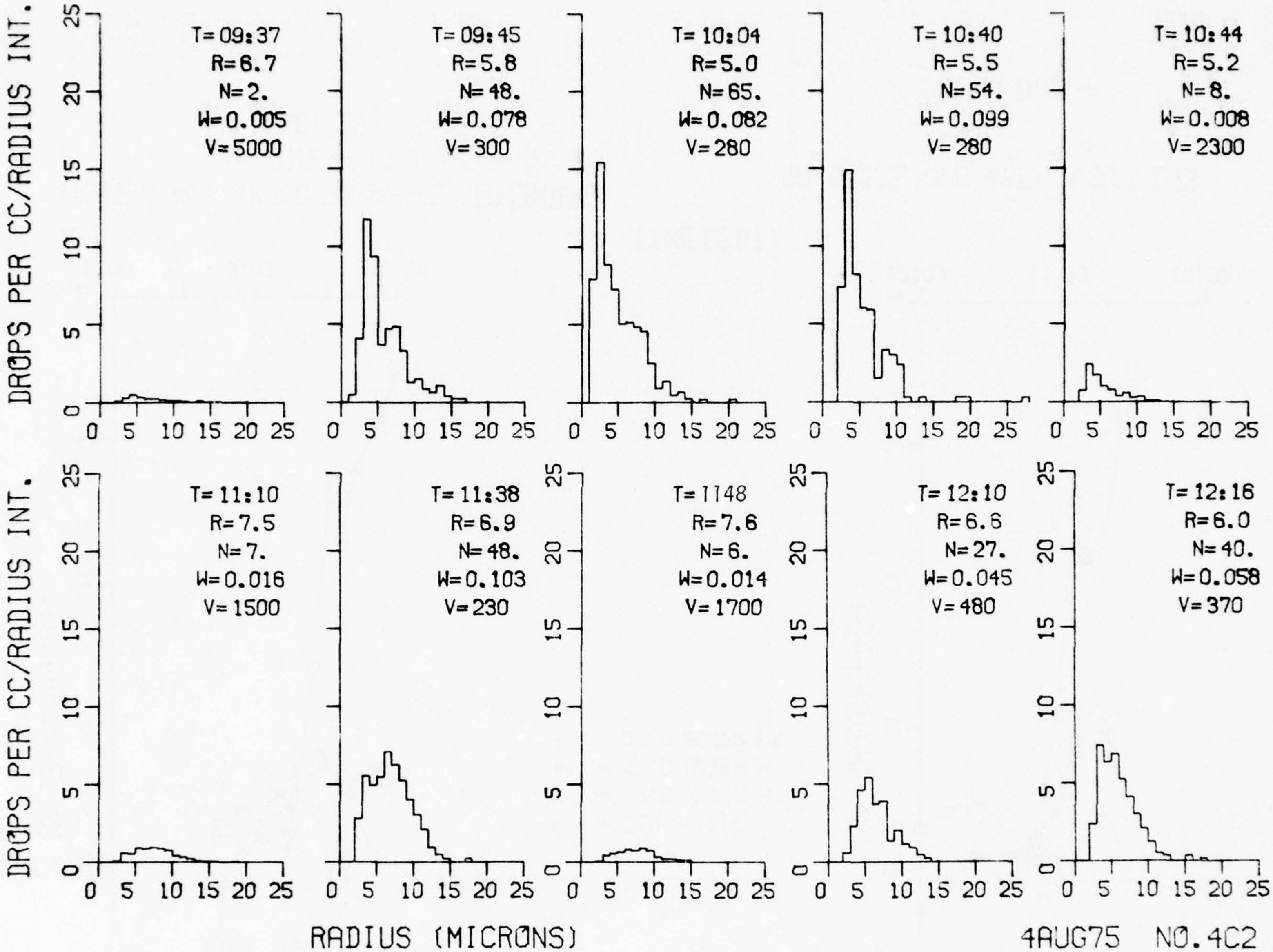
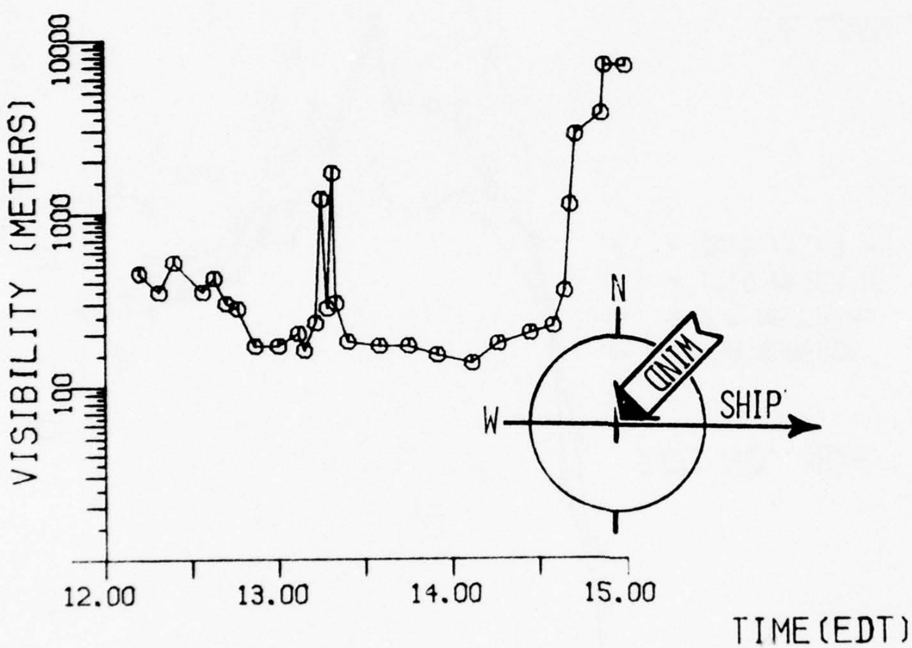


FIGURE A-35. DROP SIZE DISTRIBUTIONS --
FOGS $4c_2$, $4c_3$, AND $4c_4$, 4 AUGUST 1975

-- CALSPAN DATA --

FOG NO. 4C4 4 AUG 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-36. VISIBILITY vs. TIME -- FOG $4c_4$, 4 AUGUST 1975

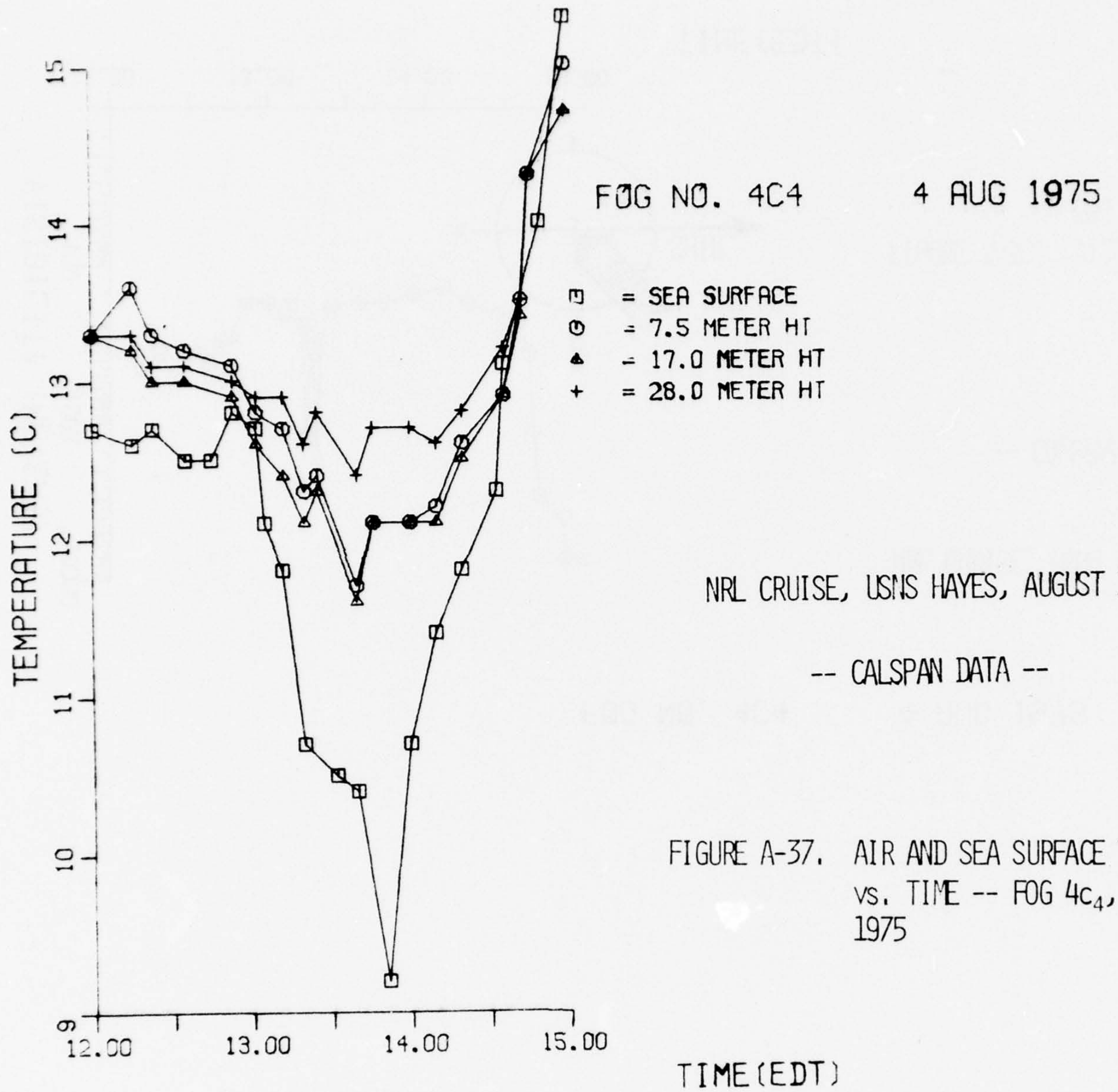
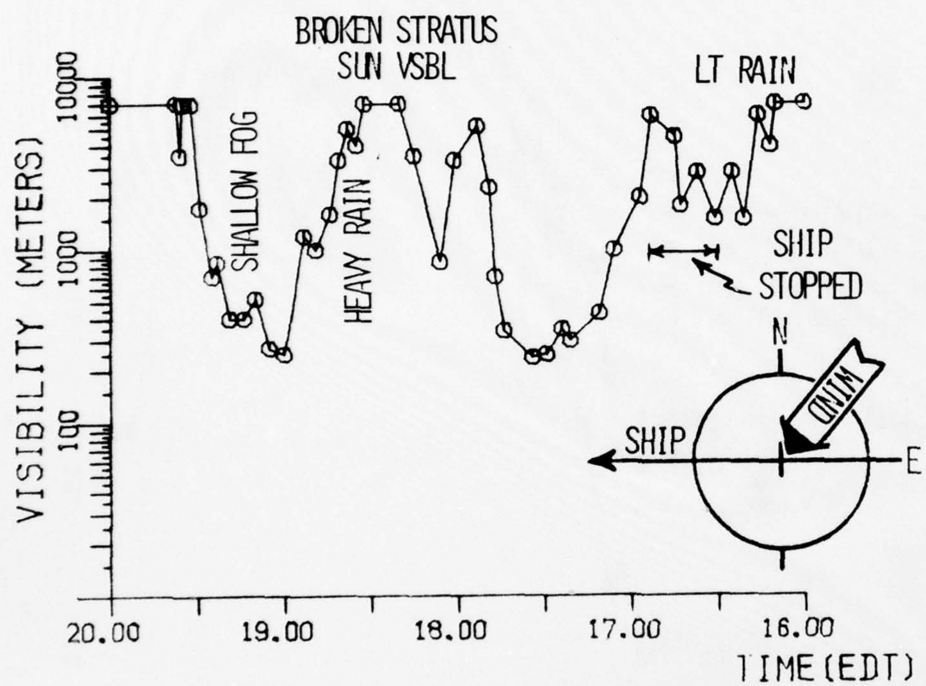


FIGURE A-37. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG $4C_4$, 4 AUGUST 1975

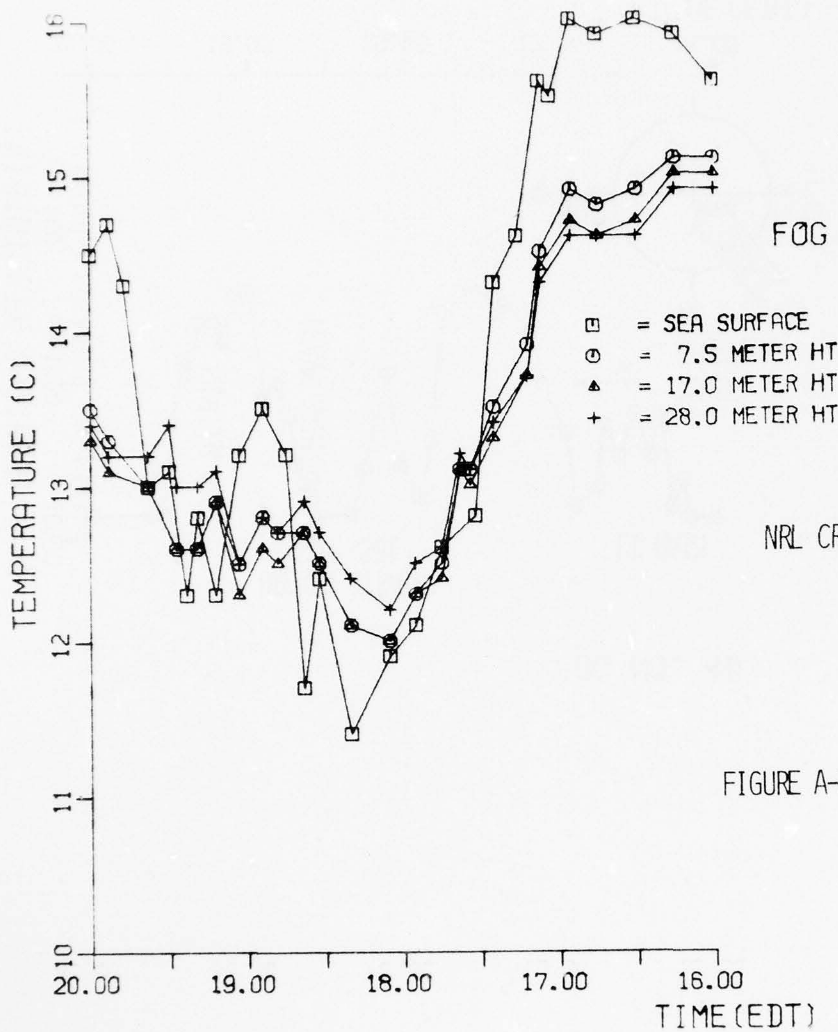
FOG NO. 4D 4 AUG 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-38. VISIBILITY vs. TIME -- FOG 4D, 4 AUGUST 1975



FOG NO. 4D 4 AUG 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-39. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 4D, 4 AUGUST 1975

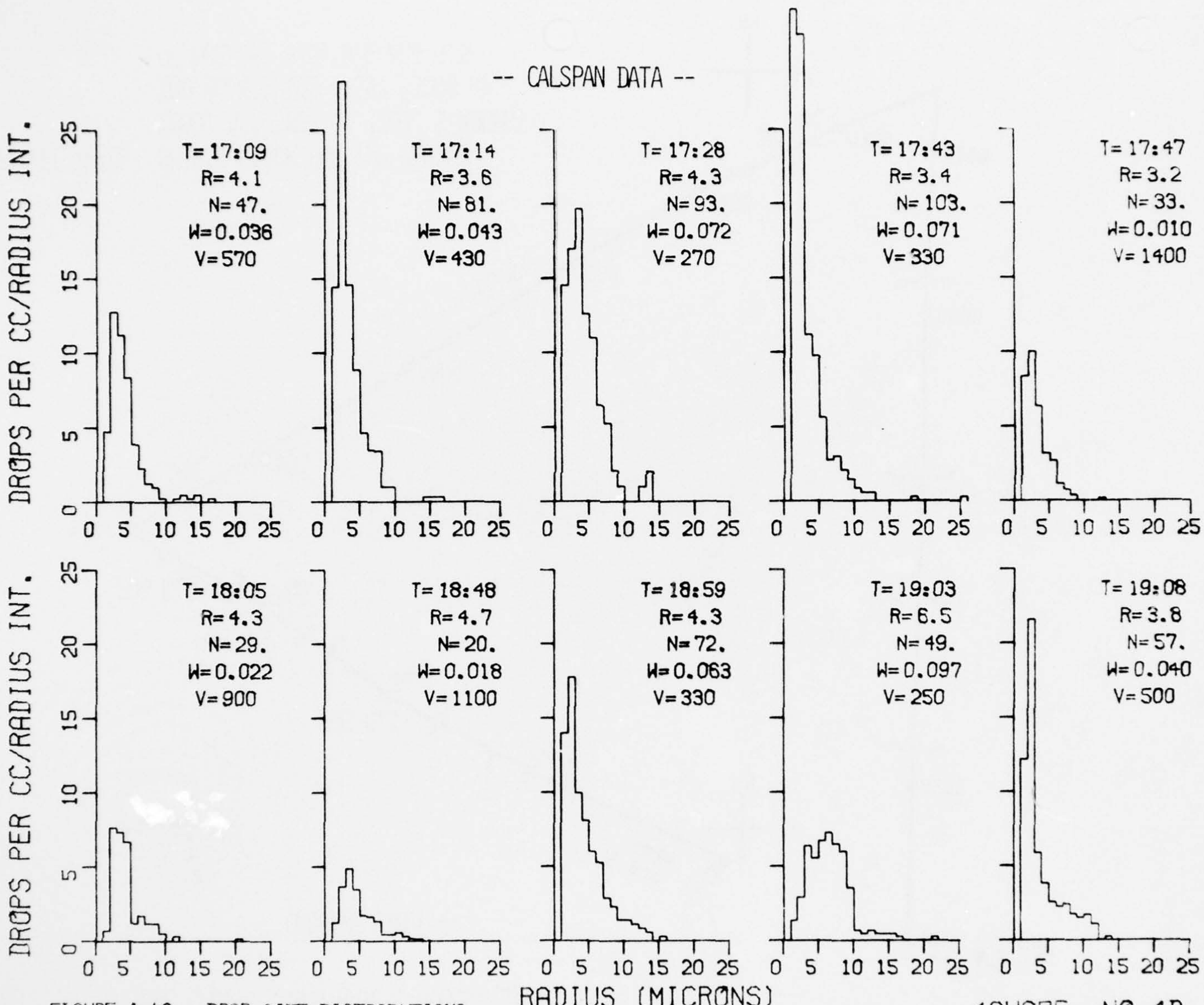


FIGURE A-40. DROP SIZE DISTRIBUTIONS --
FOG 4D, 4 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

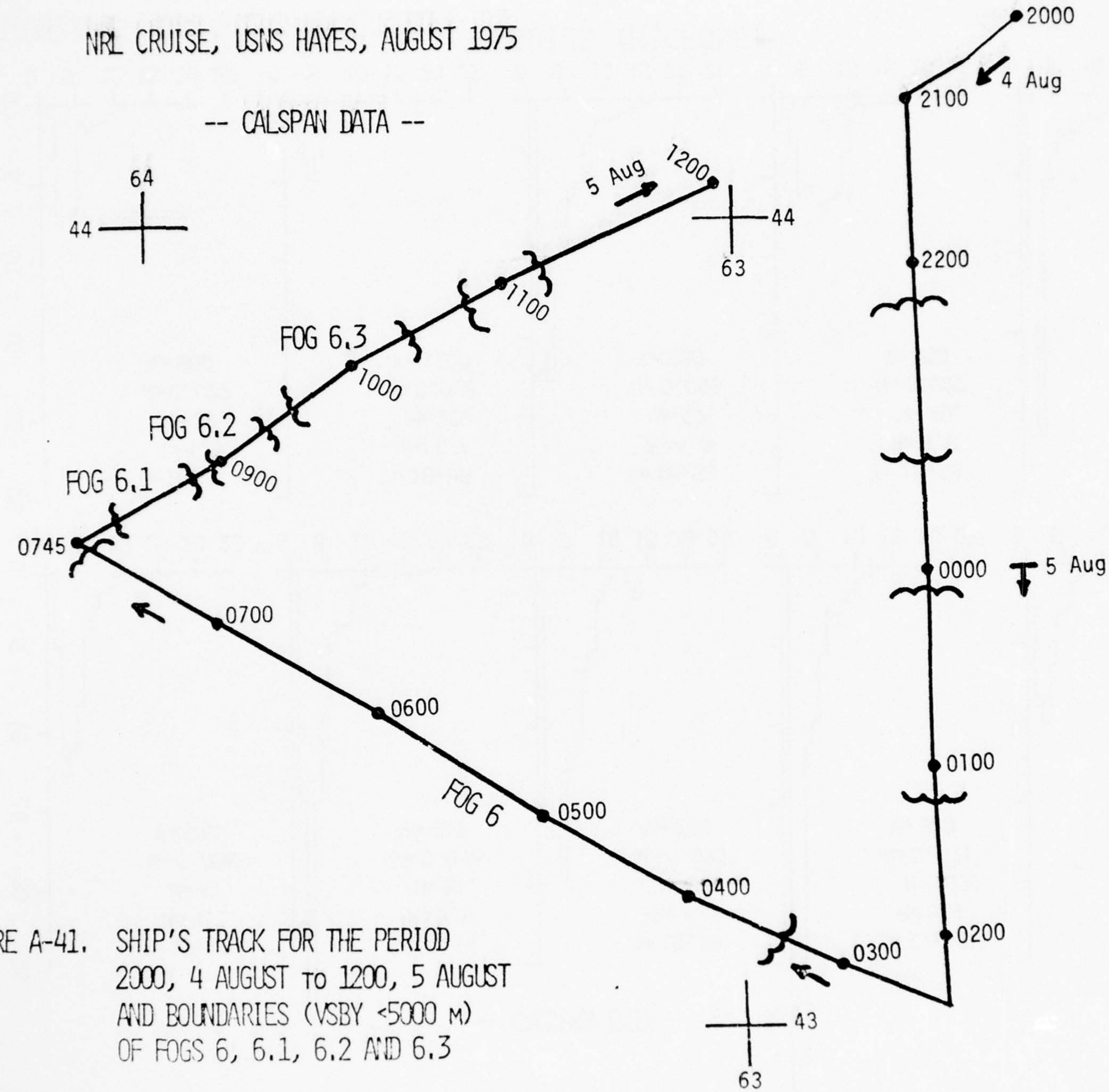
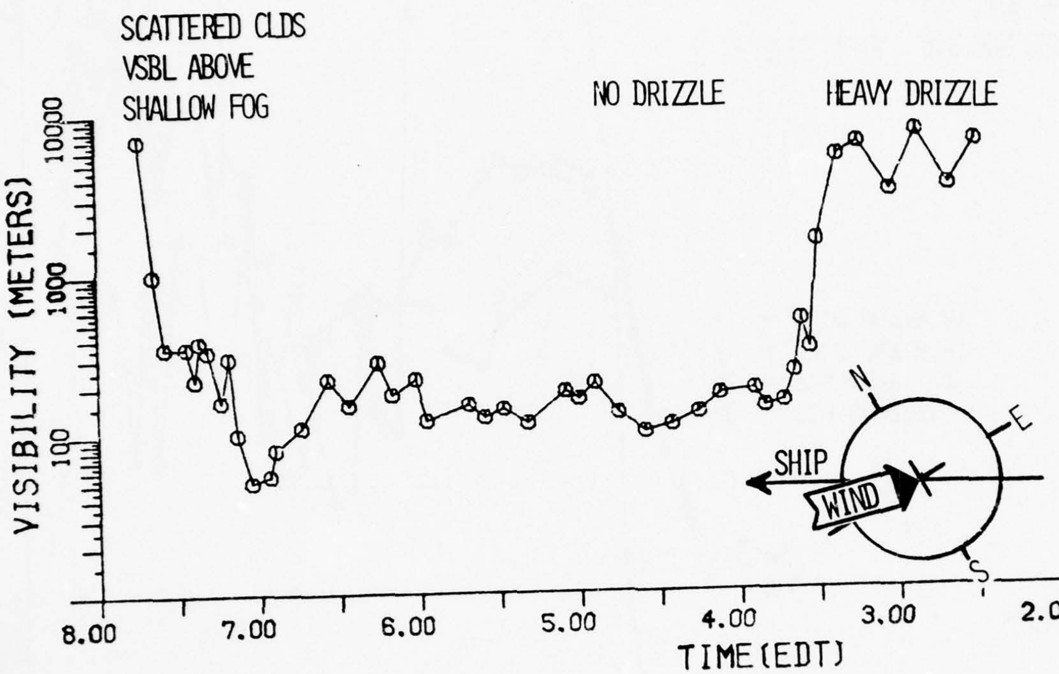


FIGURE A-41. SHIP'S TRACK FOR THE PERIOD 2000, 4 AUGUST TO 1200, 5 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOGS 6, 6.1, 6.2 AND 6.3



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-42. VISIBILITY vs. TIME -- FOG 6, 5 AUGUST 1975

-- CALSPAN DATA --

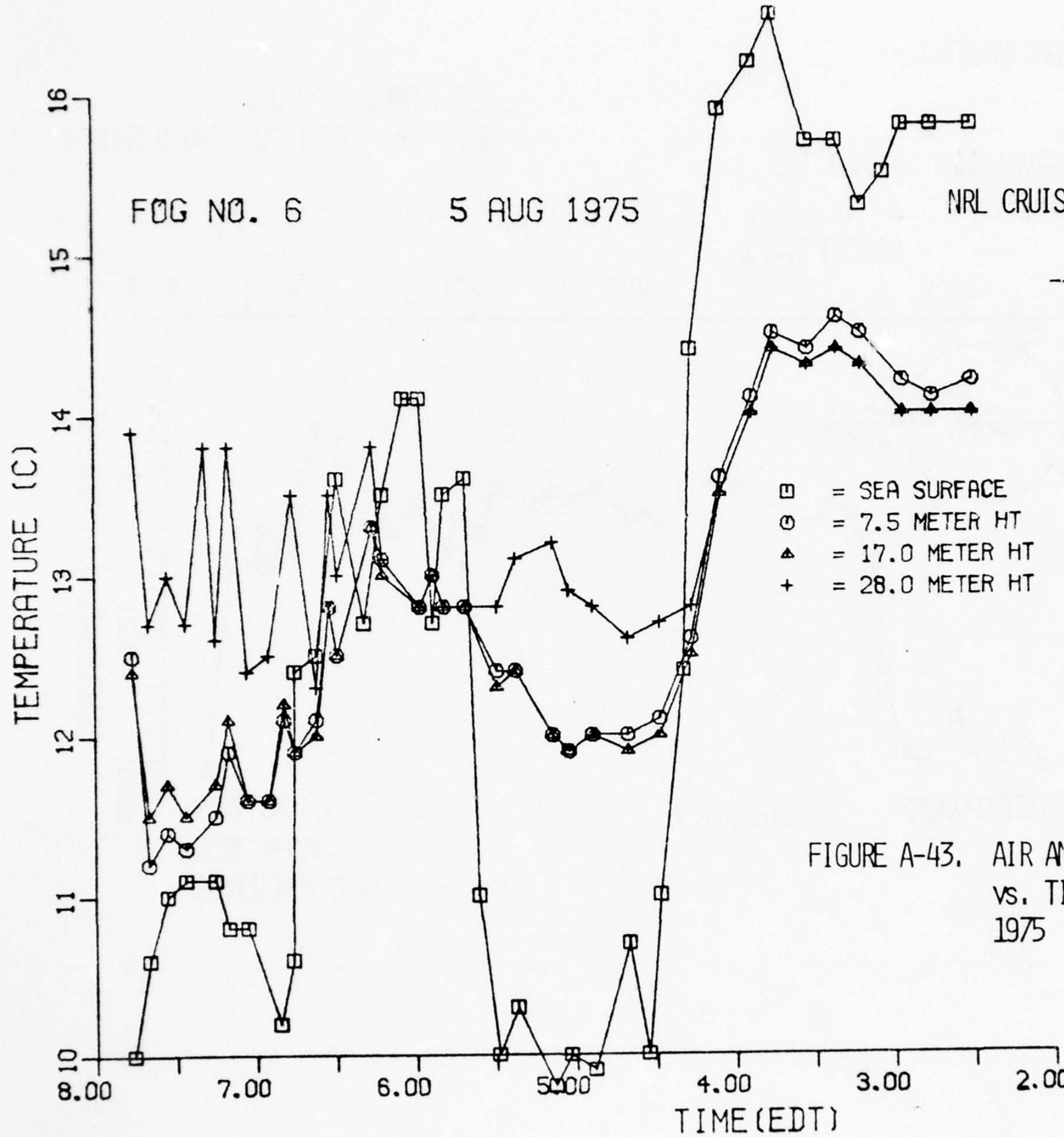


FIGURE A-43. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 6, 5 AUGUST 1975

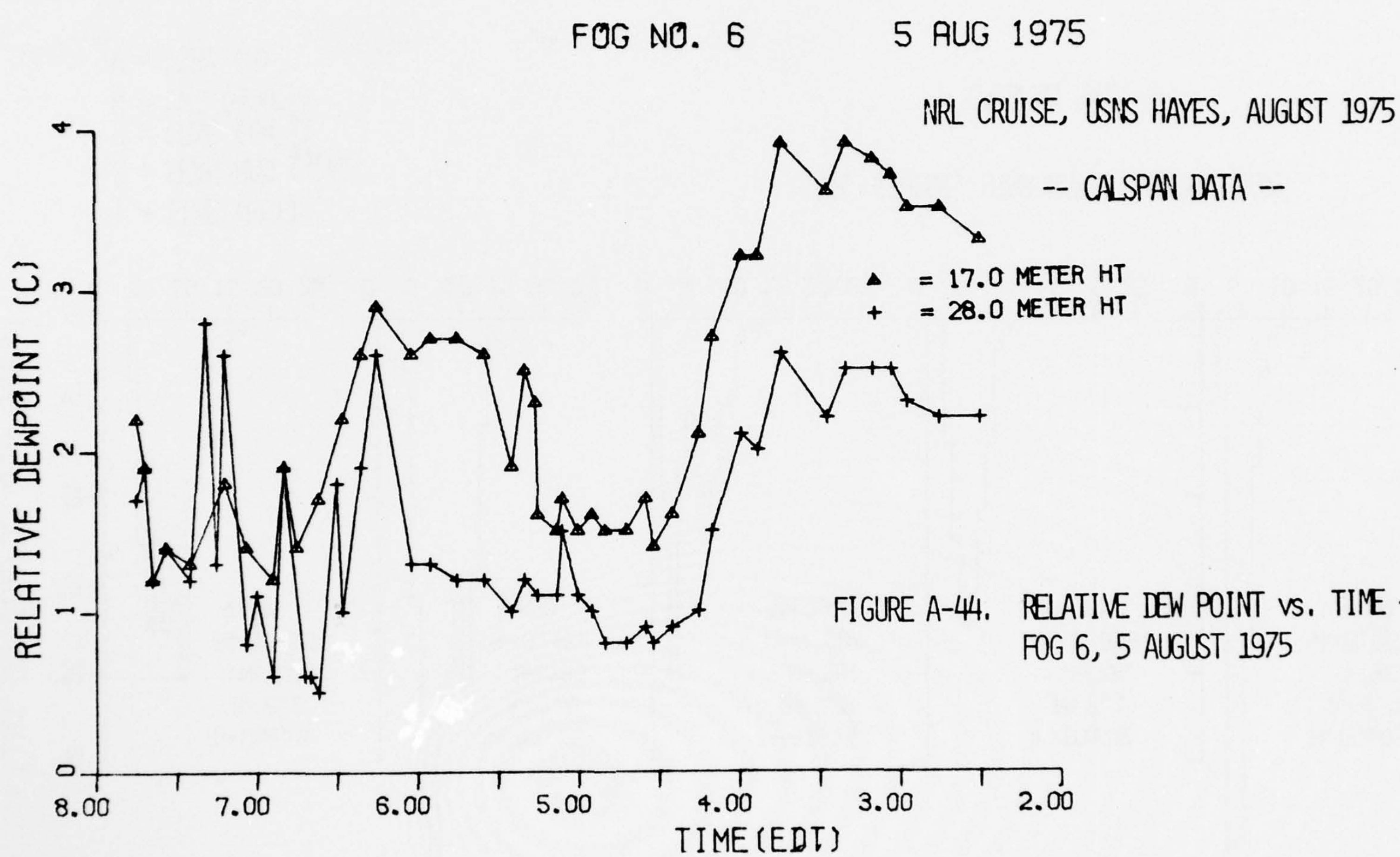
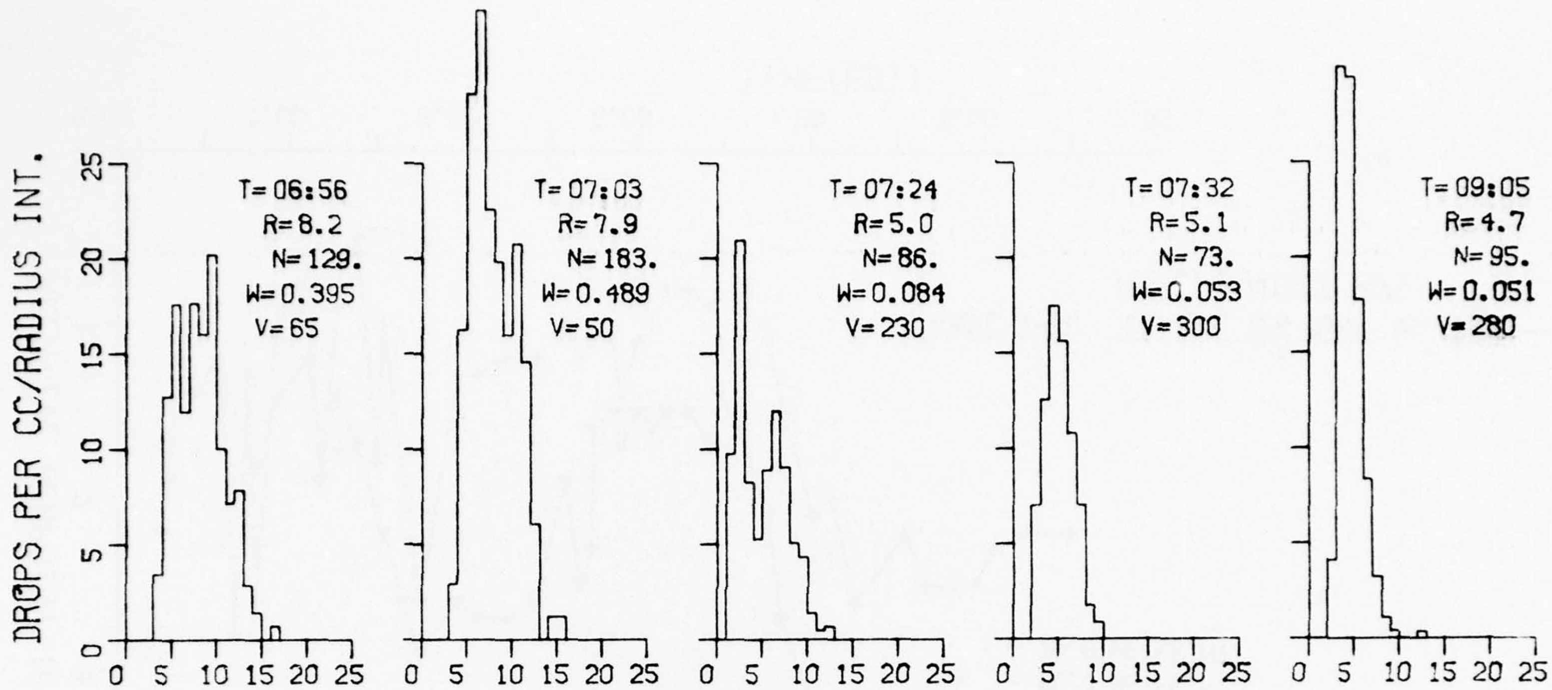


FIGURE A-44. RELATIVE DEW POINT vs. TIME -- FOG 6, 5 AUGUST 1975



T = TIME (EDT)
R = MEAN RAD (μM)
N = CONC (CM^{-3})
W = LWC ($G\ M^{-3}$)
V = VSBY (M)

NRL CRUISE, USNS HAYES, AUGUST 1975

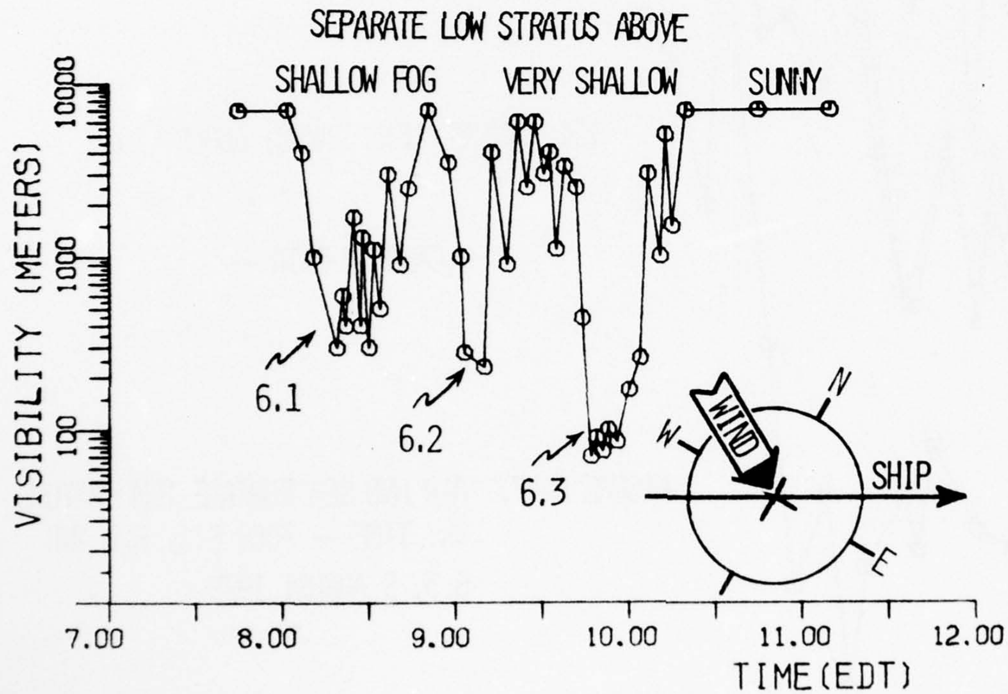
-- CALSPAN DATA --

FIGURE A-45. DROP SIZE DISTRIBUTIONS --
FOG 6, 5 AUGUST 1975

RADIUS (MICRONS)

5AUG75 NO.

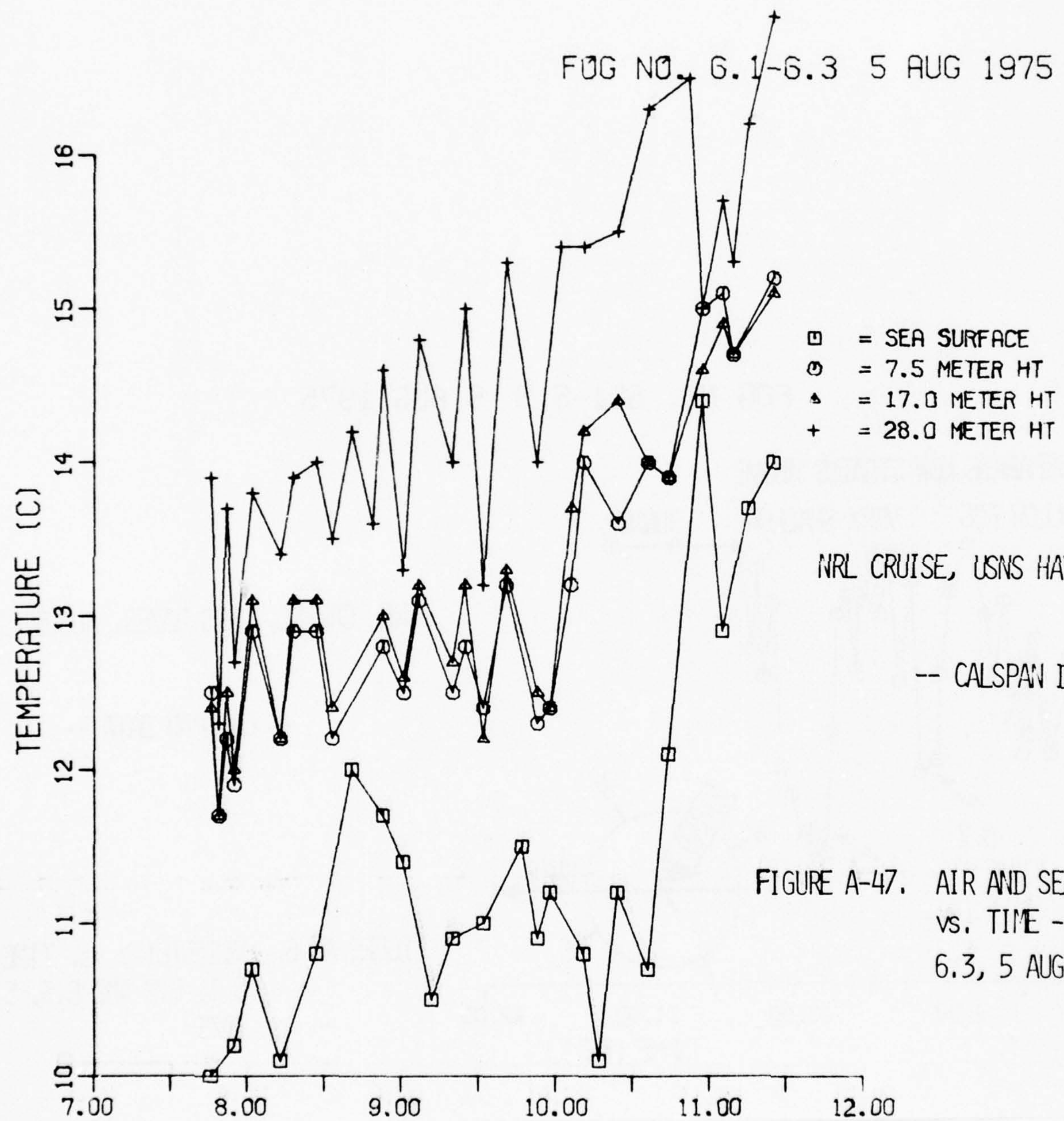
FOG NO. 6.1-6.3 5 AUG 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

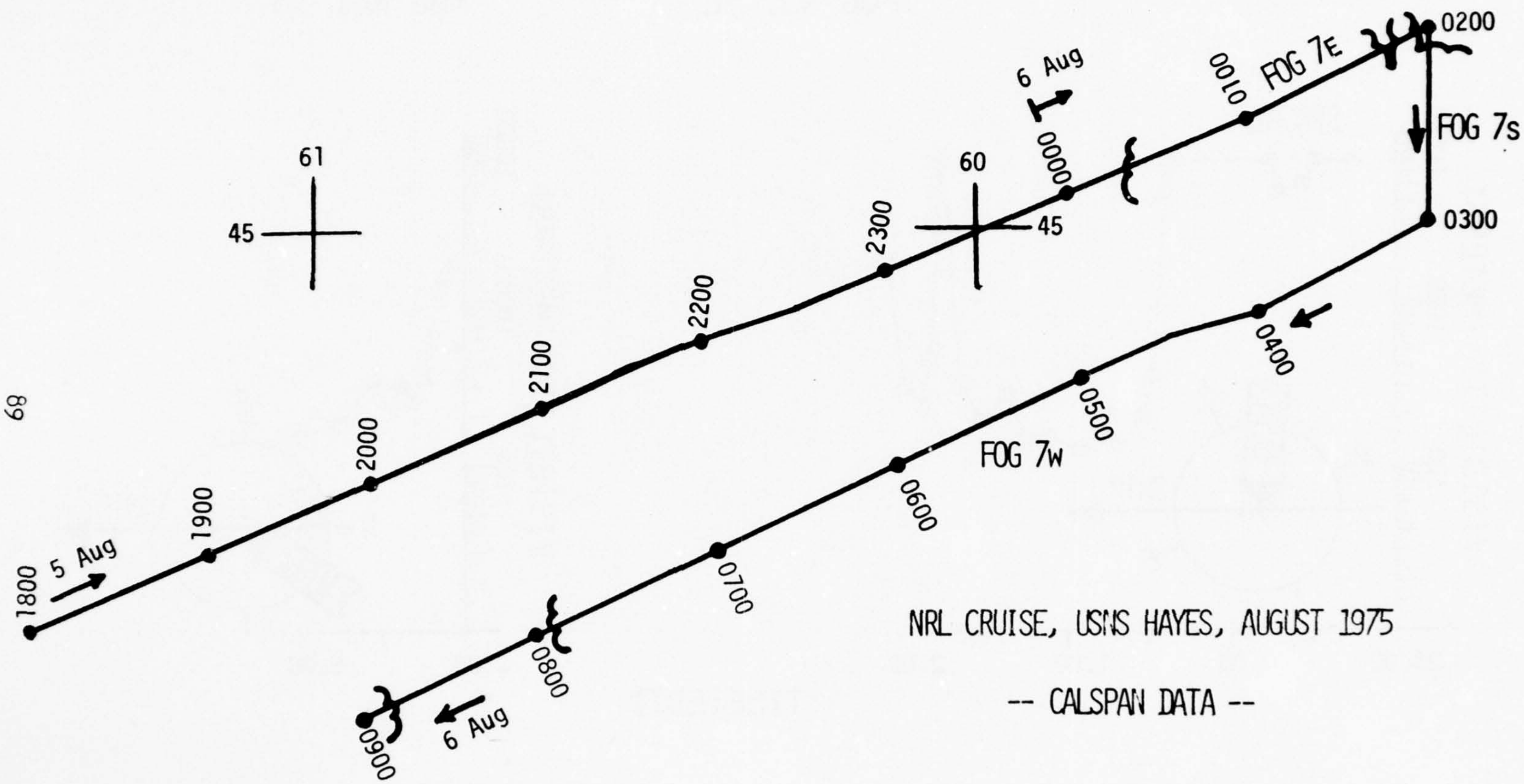
FIGURE A-46. VISIBILITY vs. TIME -- FOGS 6.1, 6.2 AND 6.3, 5 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-47. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOGS 6.1, 6.2 AND 6.3, 5 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-48. SHIP'S TRACK FOR THE PERIOD 1800, 5 AUGUST TO 0900, 6 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 7

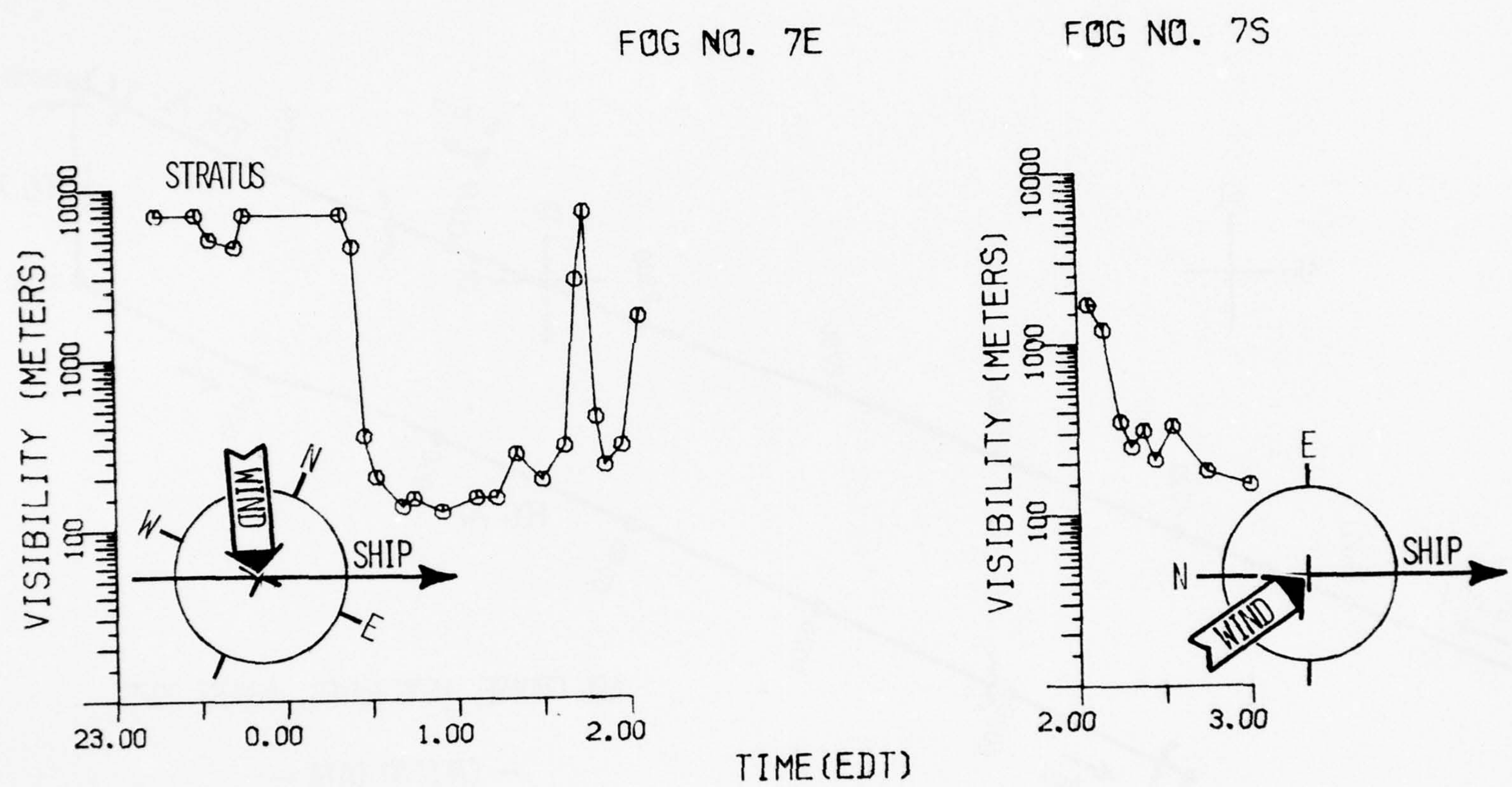
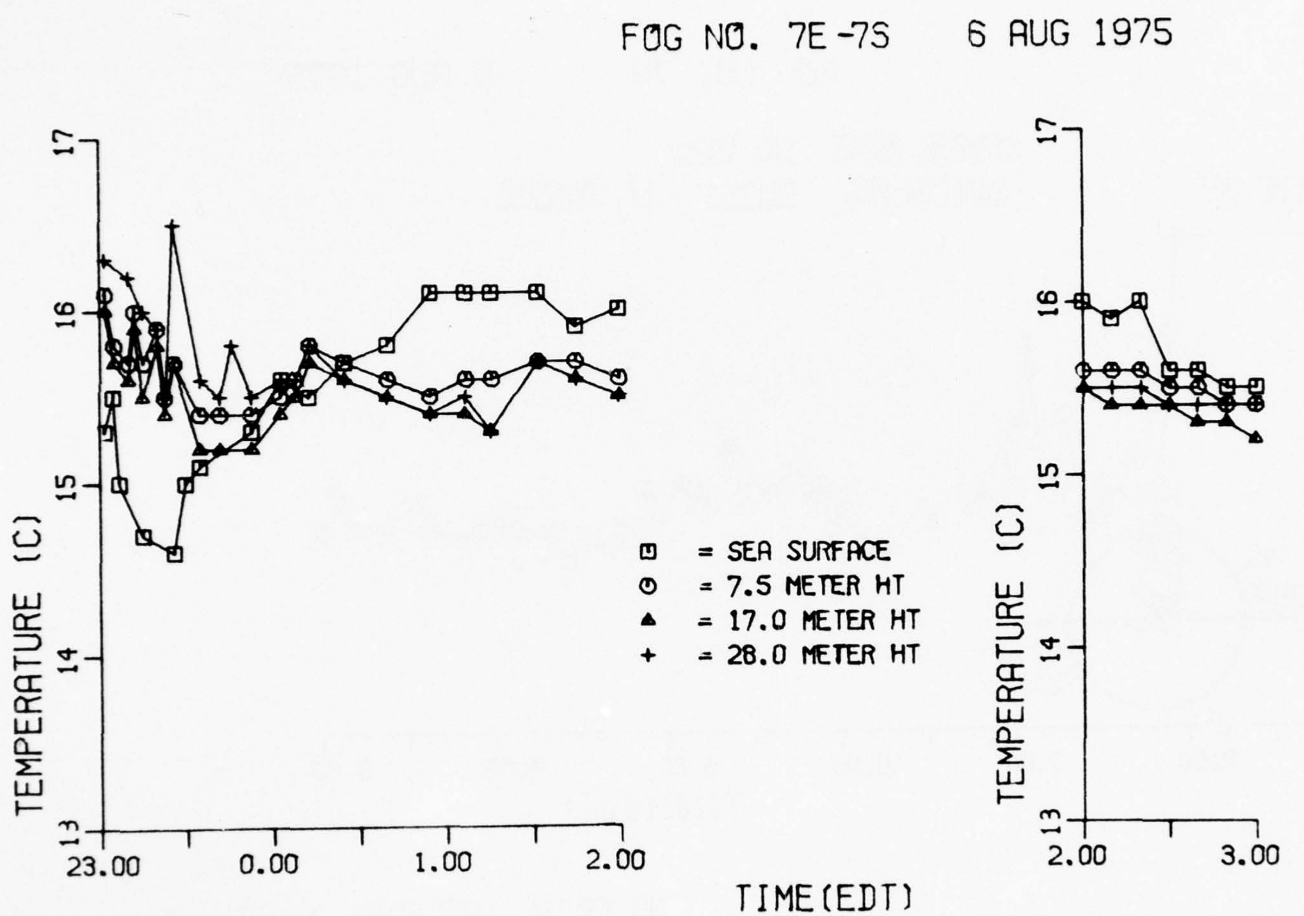


FIGURE A-49. VISIBILITY vs. TIME -- FOG 7E AND 7S, 6 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

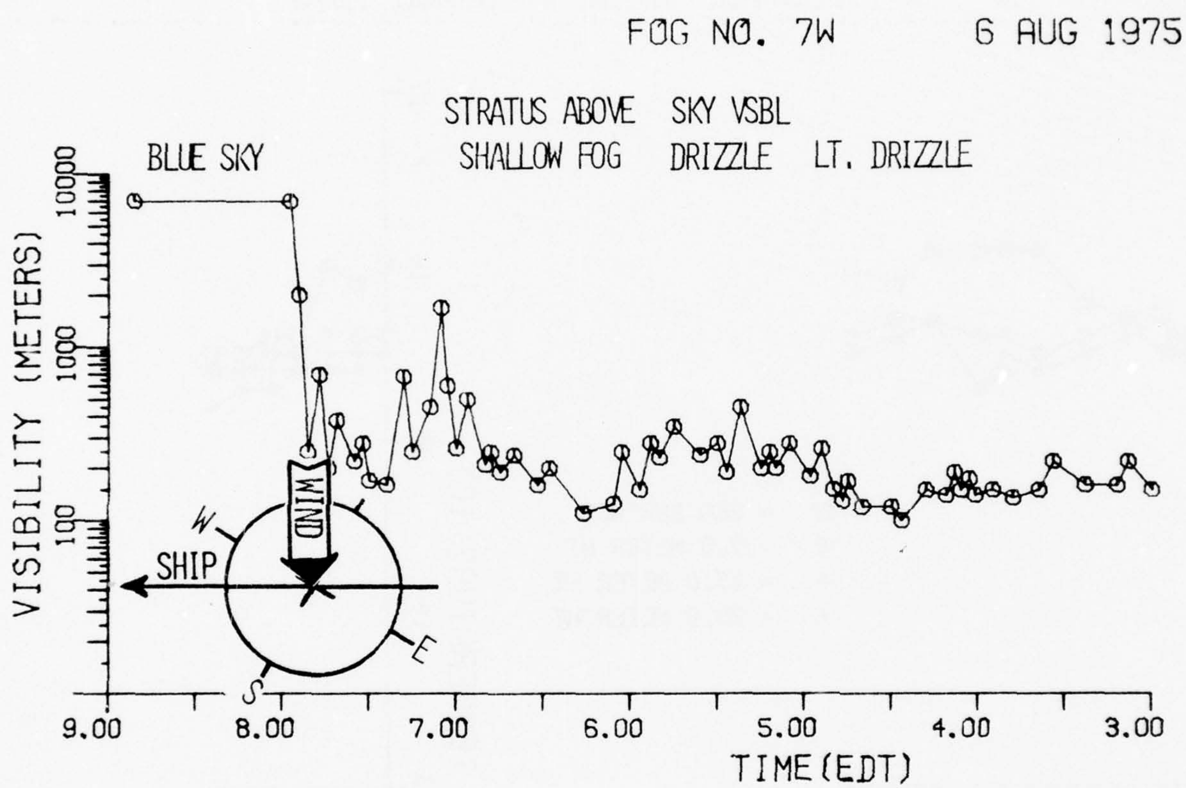
-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-50. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOGS 7E AND 7S, 6 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-51. VISIBILITY vs. TIME --
FOG 7w, 6 AUGUST 1975

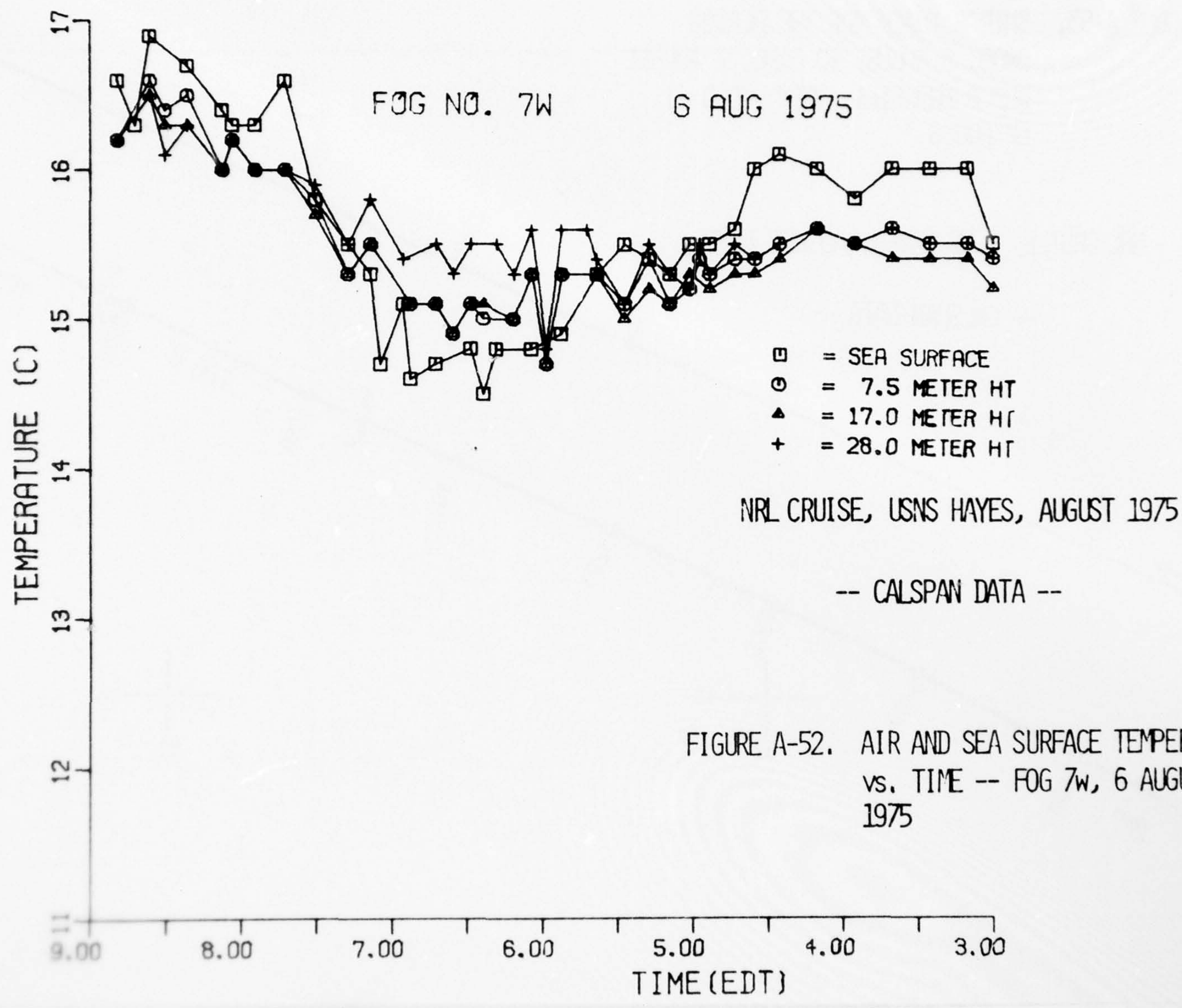


FIGURE A-52. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 7w, 6 AUGUST 1975

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MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)

1975 S G GATHMAN, R E LARSON

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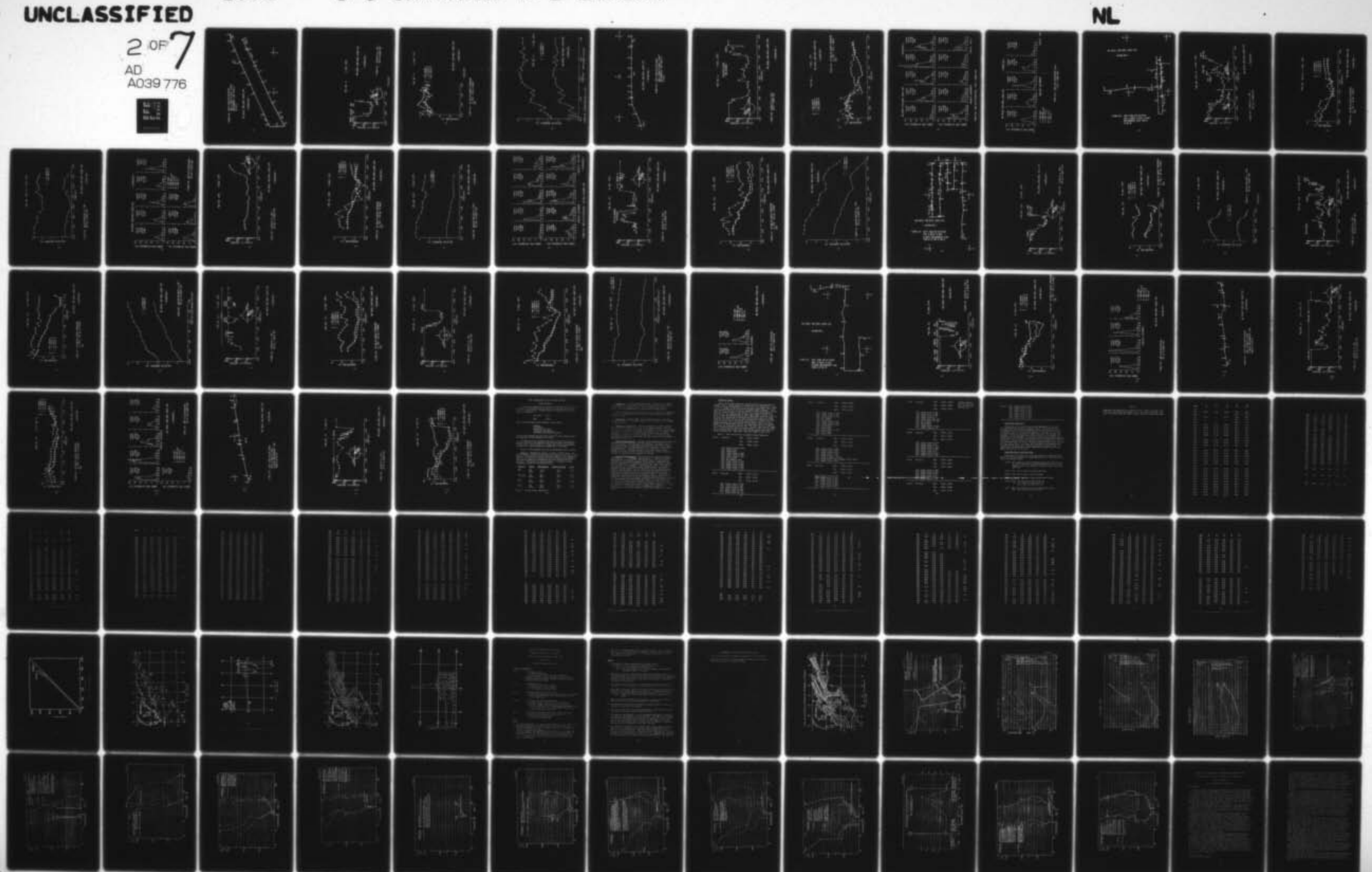
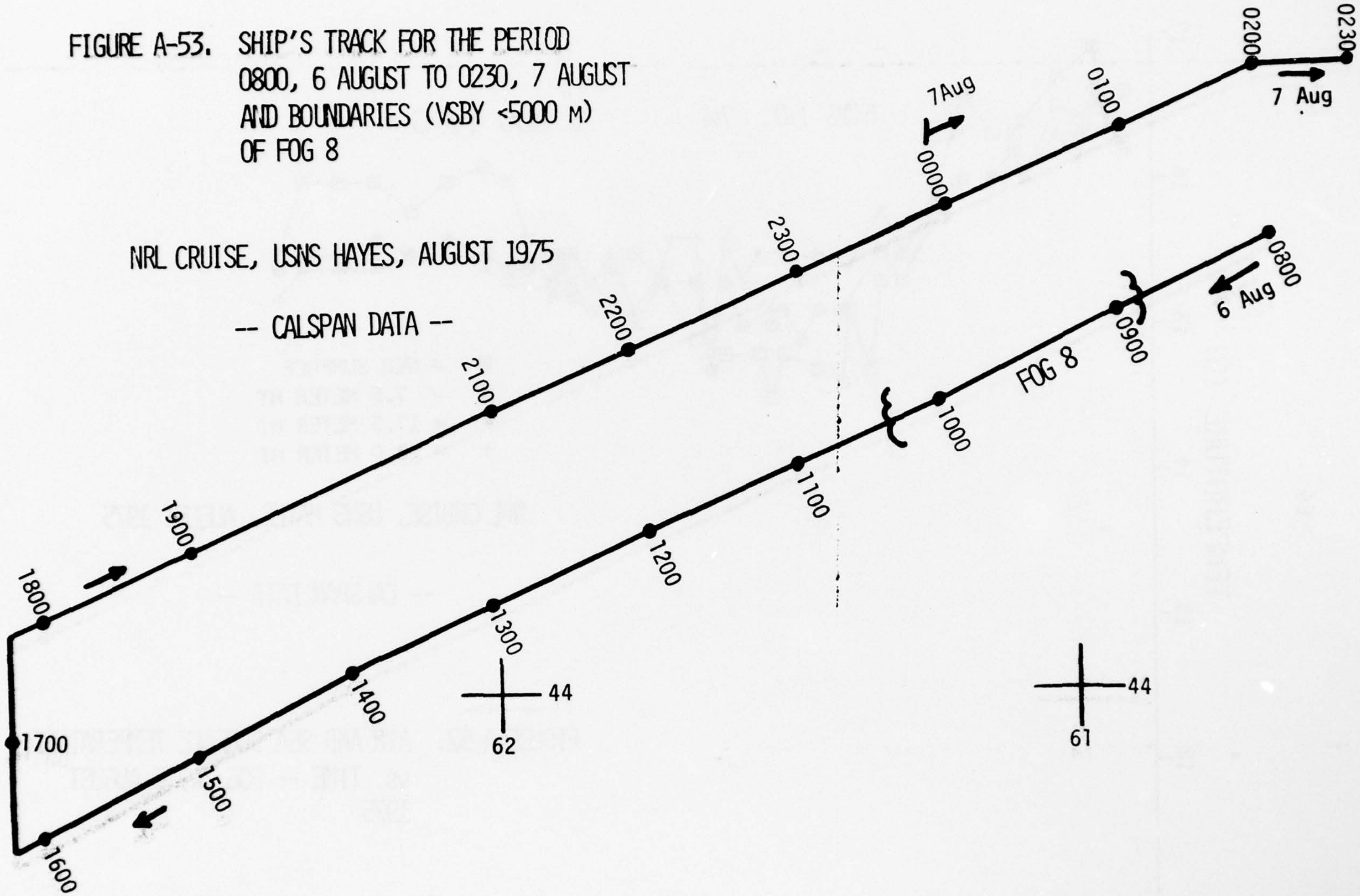


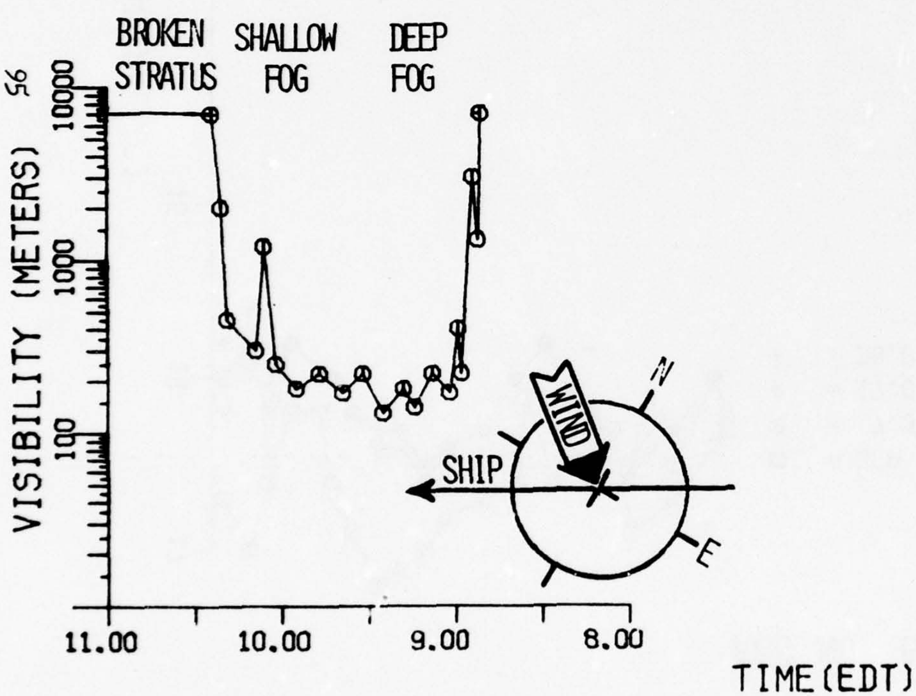
FIGURE A-53. SHIP'S TRACK FOR THE PERIOD 0800, 6 AUGUST TO 0230, 7 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 8

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --



FOG NO. 8 6 AUG 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-54. VISIBILITY vs. TIME -- FOG 8, 6 AUGUST 1975

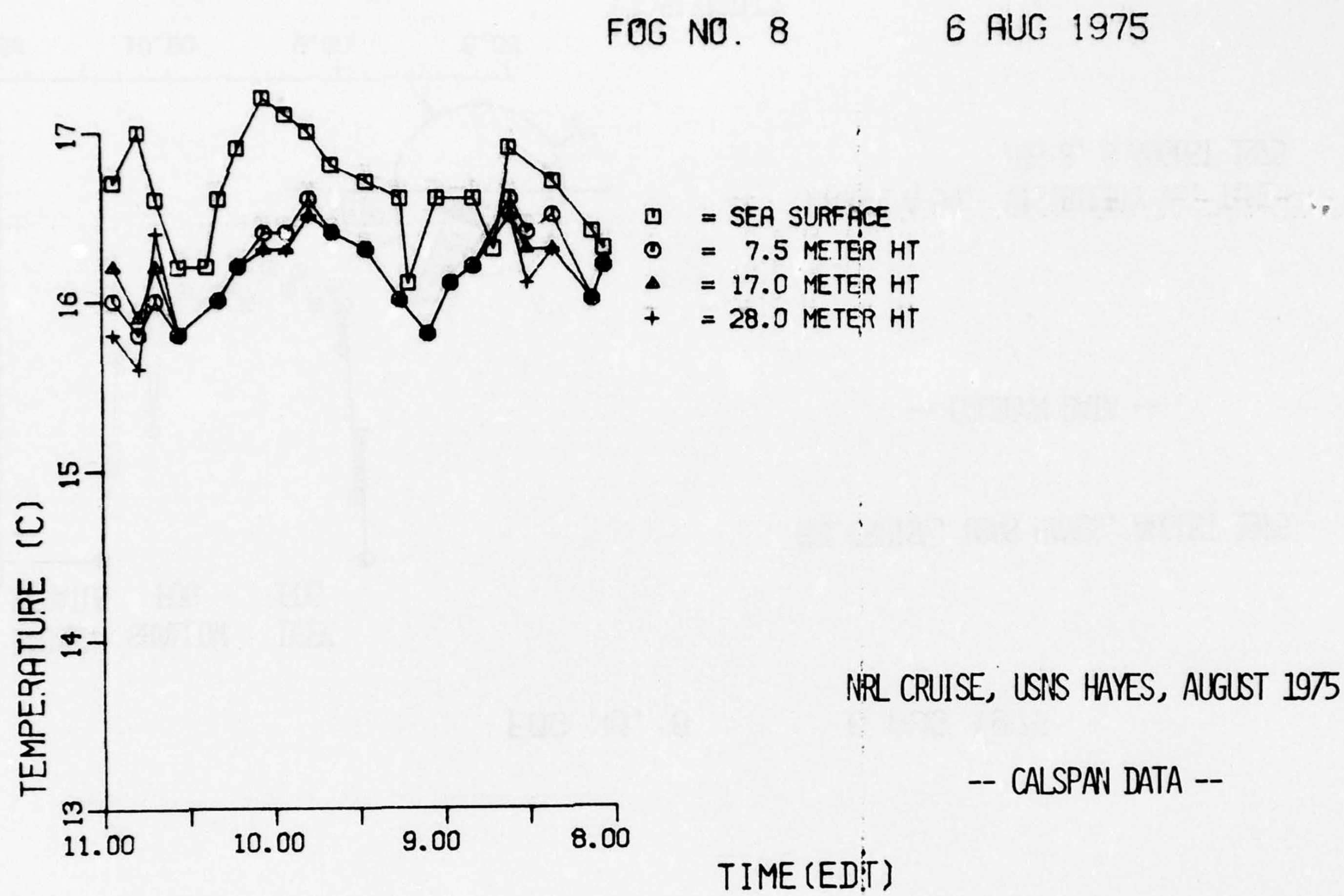


FIGURE A-55. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 8, 6 AUGUST 1975

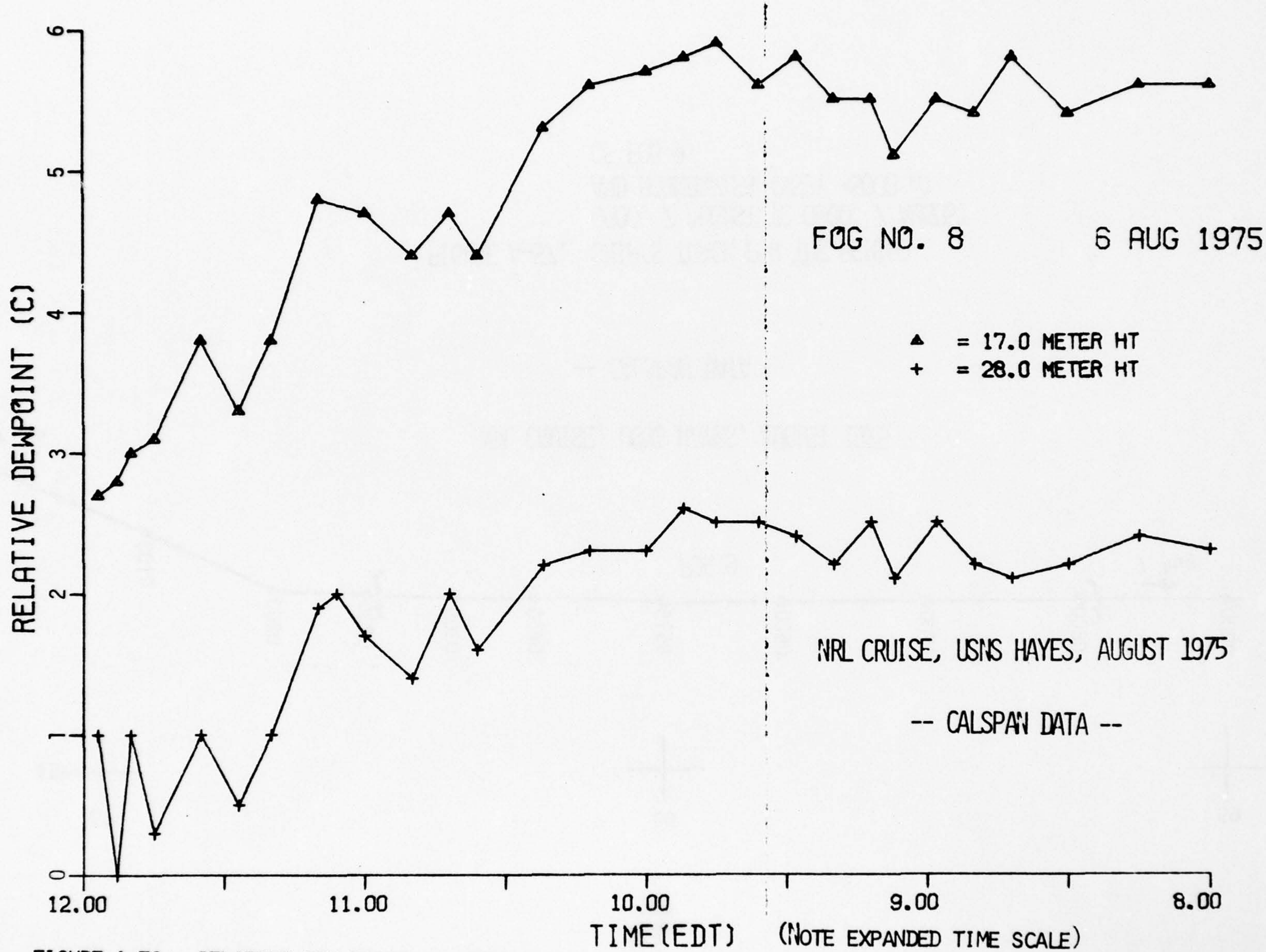
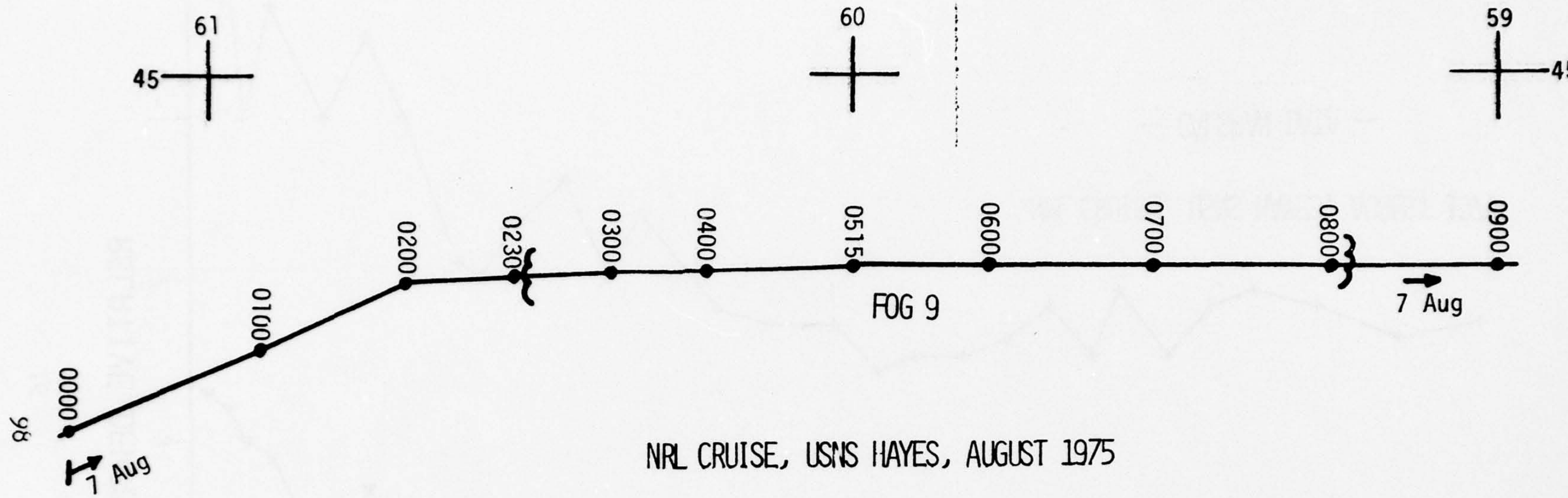


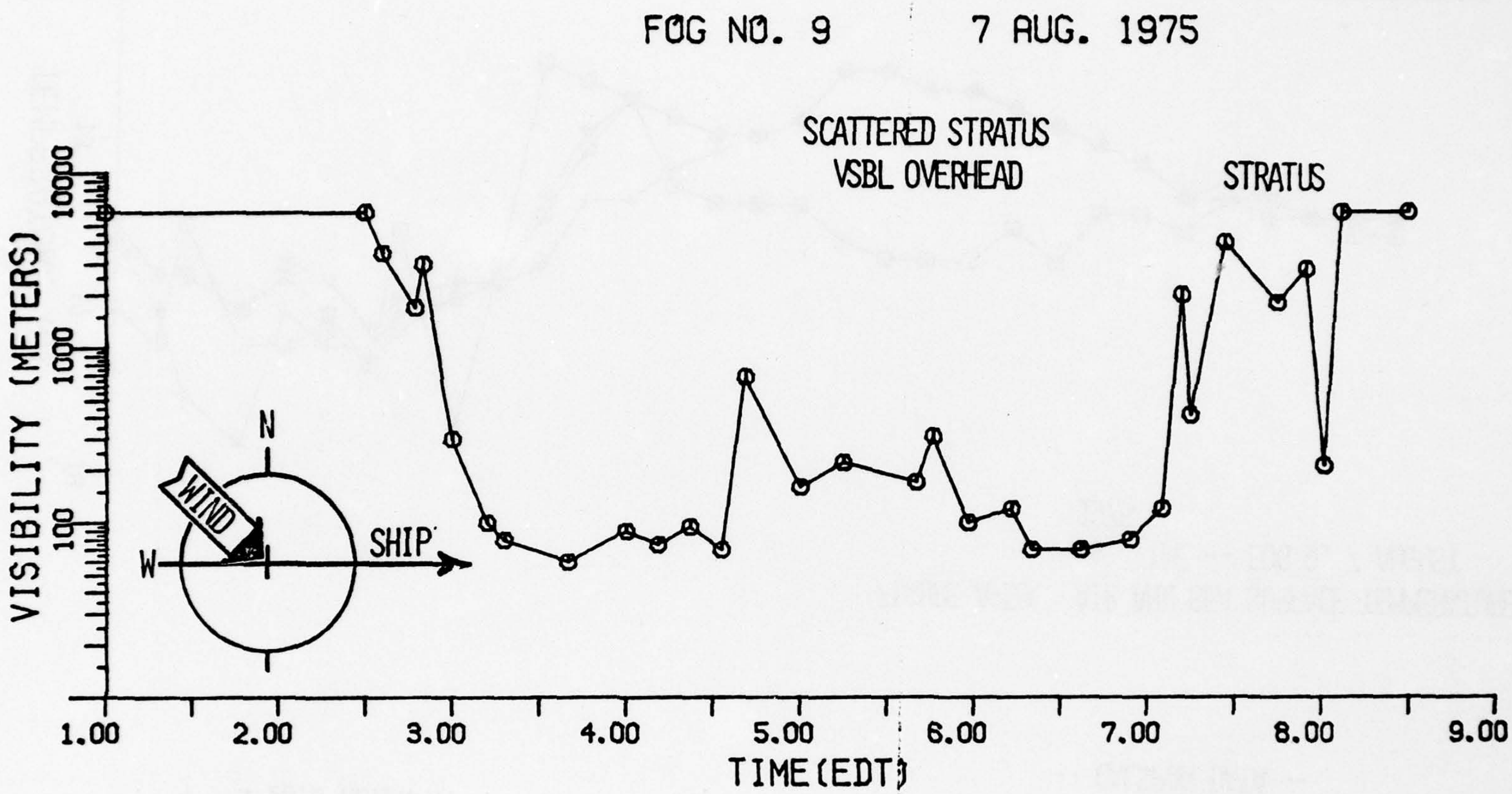
FIGURE A-56. RELATIVE DEW POINT vs. TIME --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-57. SHIP'S TRACK FOR THE PERIOD 0000, 7 AUGUST TO 0900, 7 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 9



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-58. VISIBILITY vs. TIME -- FOG 9, 7 AUGUST 1975

-- CALSPAN DATA --

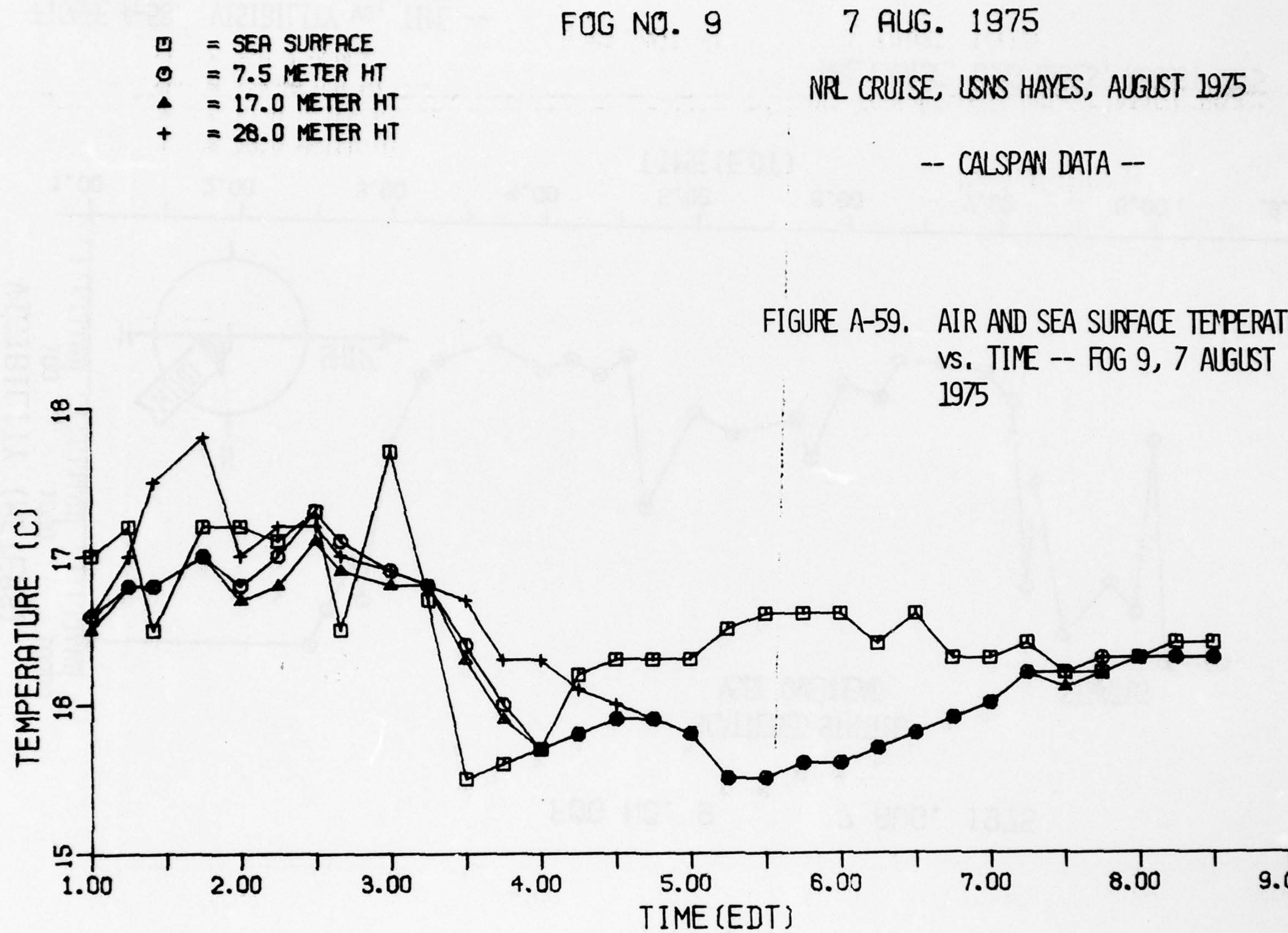


FIGURE A-59. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 9, 7 AUGUST 1975

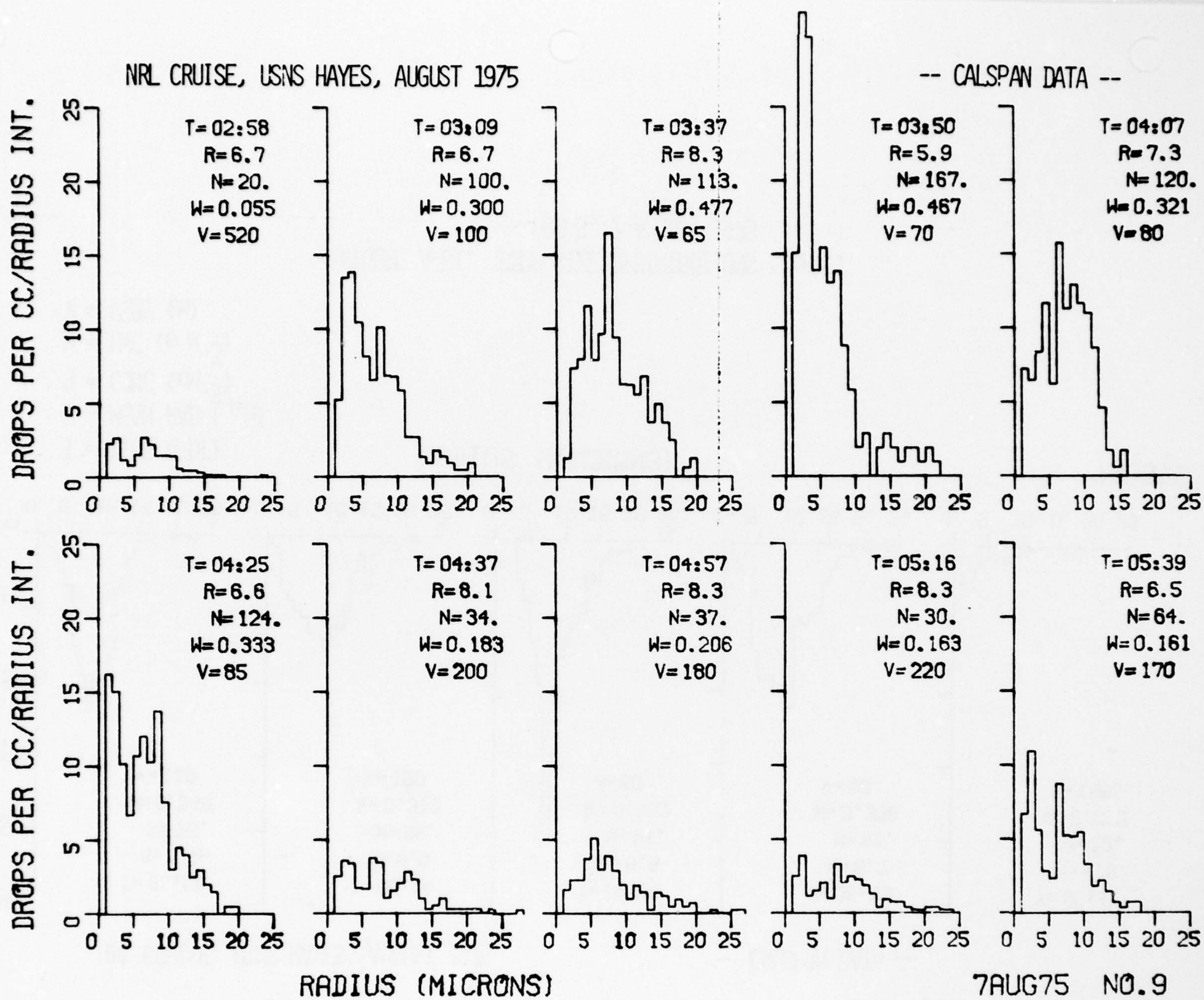


FIGURE A-60. DROP SIZE DISTRIBUTIONS -- FOG 9, 7 AUGUST 1975

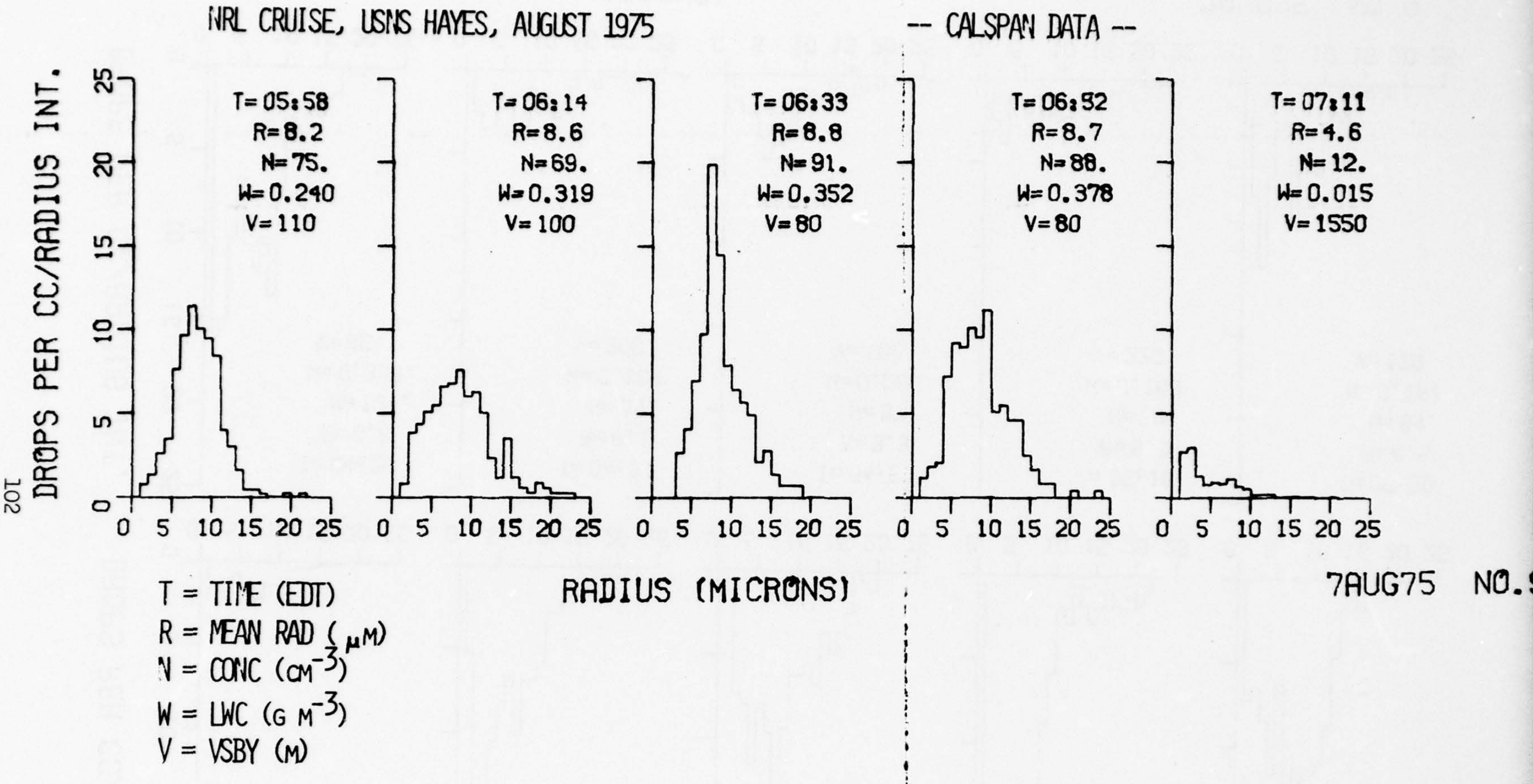


FIGURE A-61. DROP SIZE DISTRIBUTIONS (CONT.)
-- FOG 9, 7 AUGUST 1975

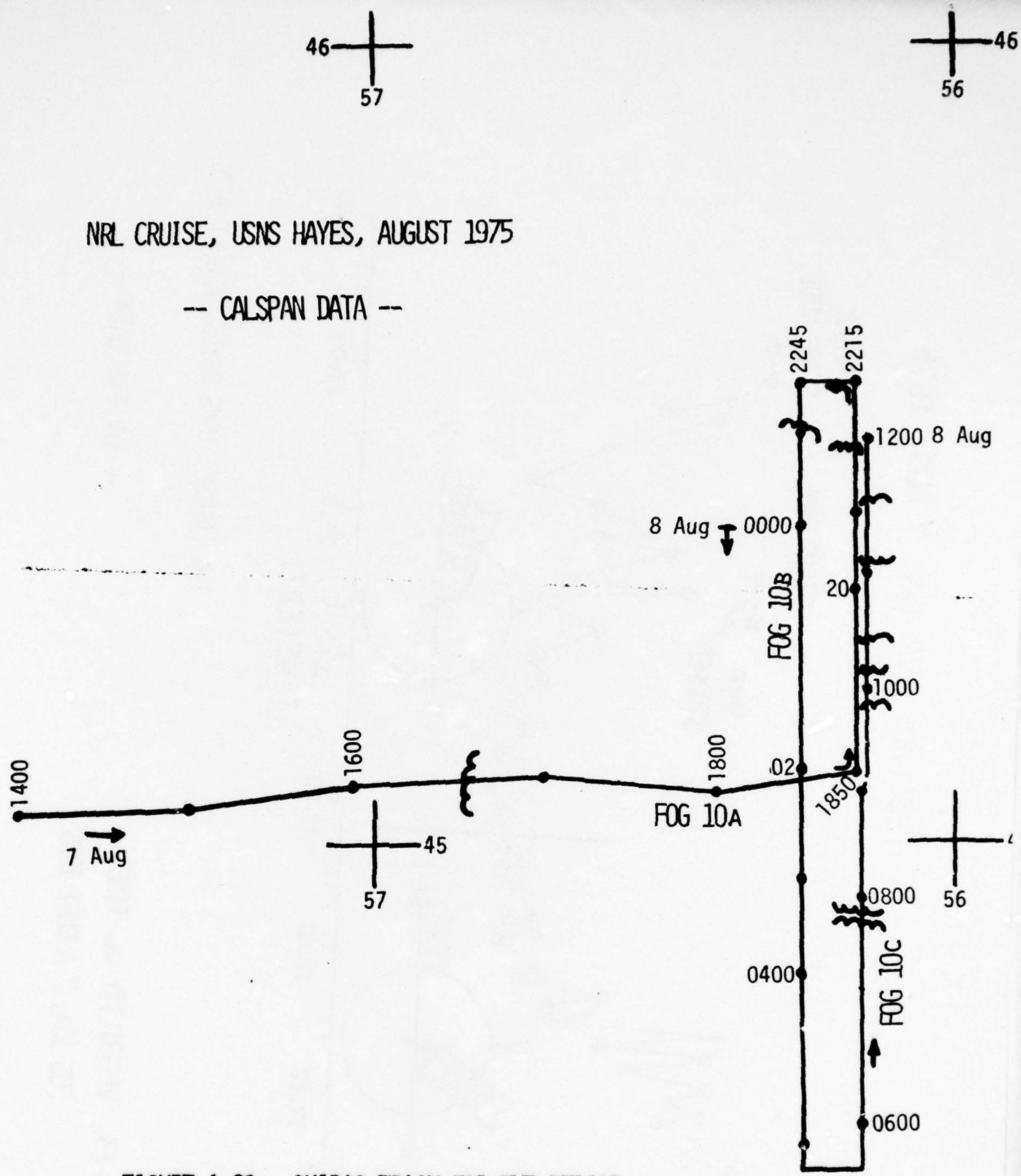
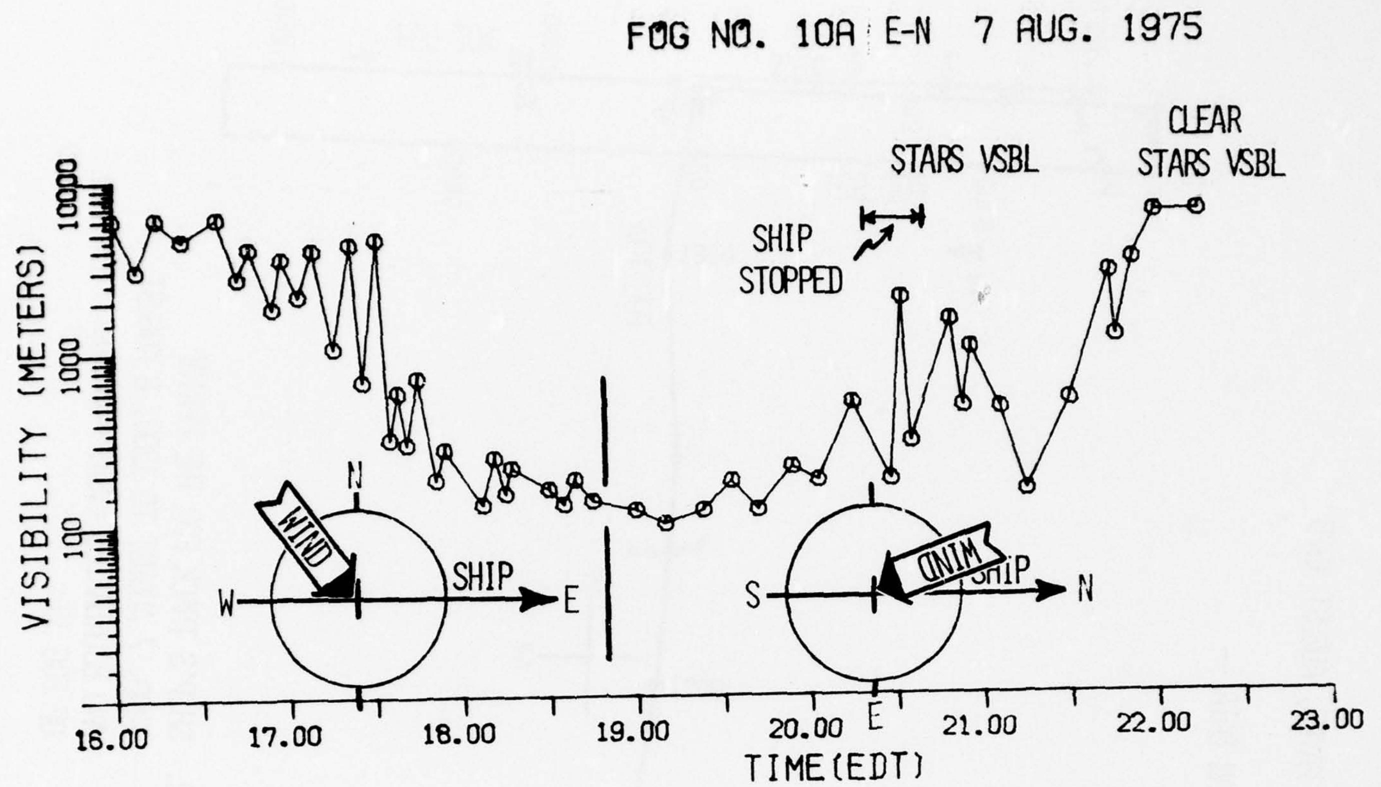


FIGURE A-62. SHIP'S TRACK FOR THE PERIOD 1400, 7 AUGUST TO 1200, 8 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 10



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-63. VISIBILITY vs. TIME --
FOG 10A, 7 AUGUST 1975

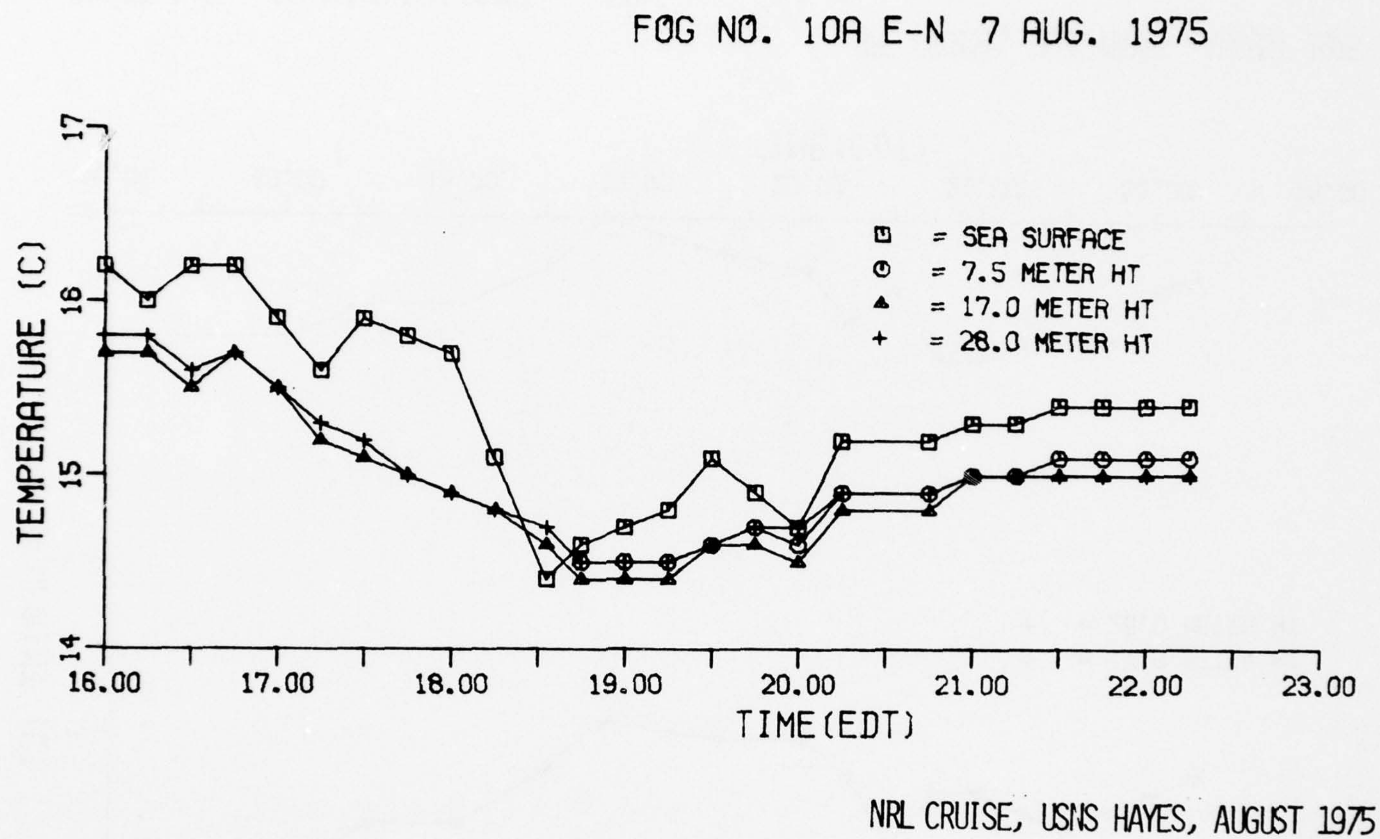
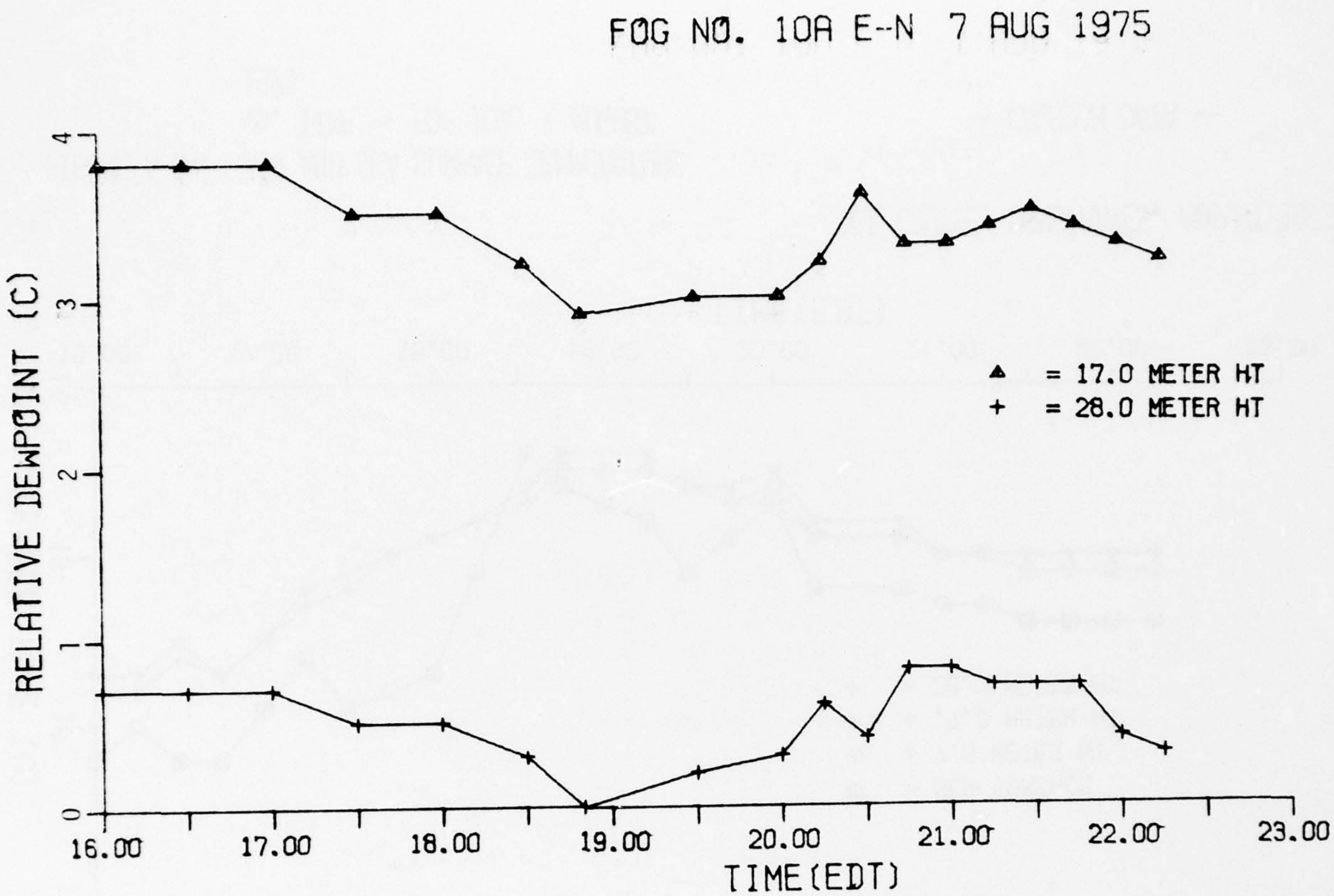


FIGURE A-64. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 10A, 7 AUGUST 1975

-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-65. RELATIVE DEW POINT vs. TIME -- FOG 10A, 7 AUGUST 1975

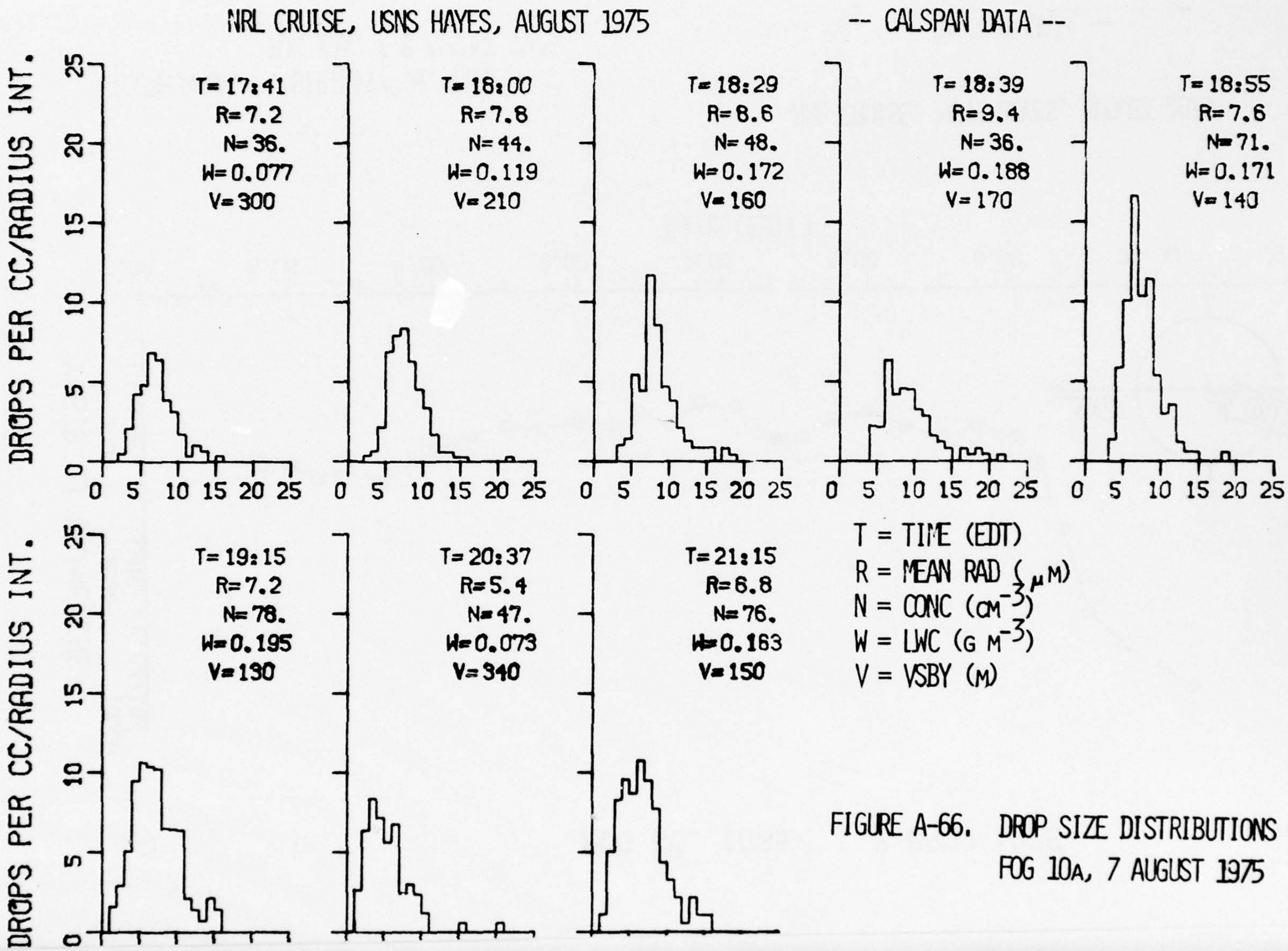


FIGURE A-66. DROP SIZE DISTRIBUTIONS -- FOG 10A, 7 AUGUST 1975

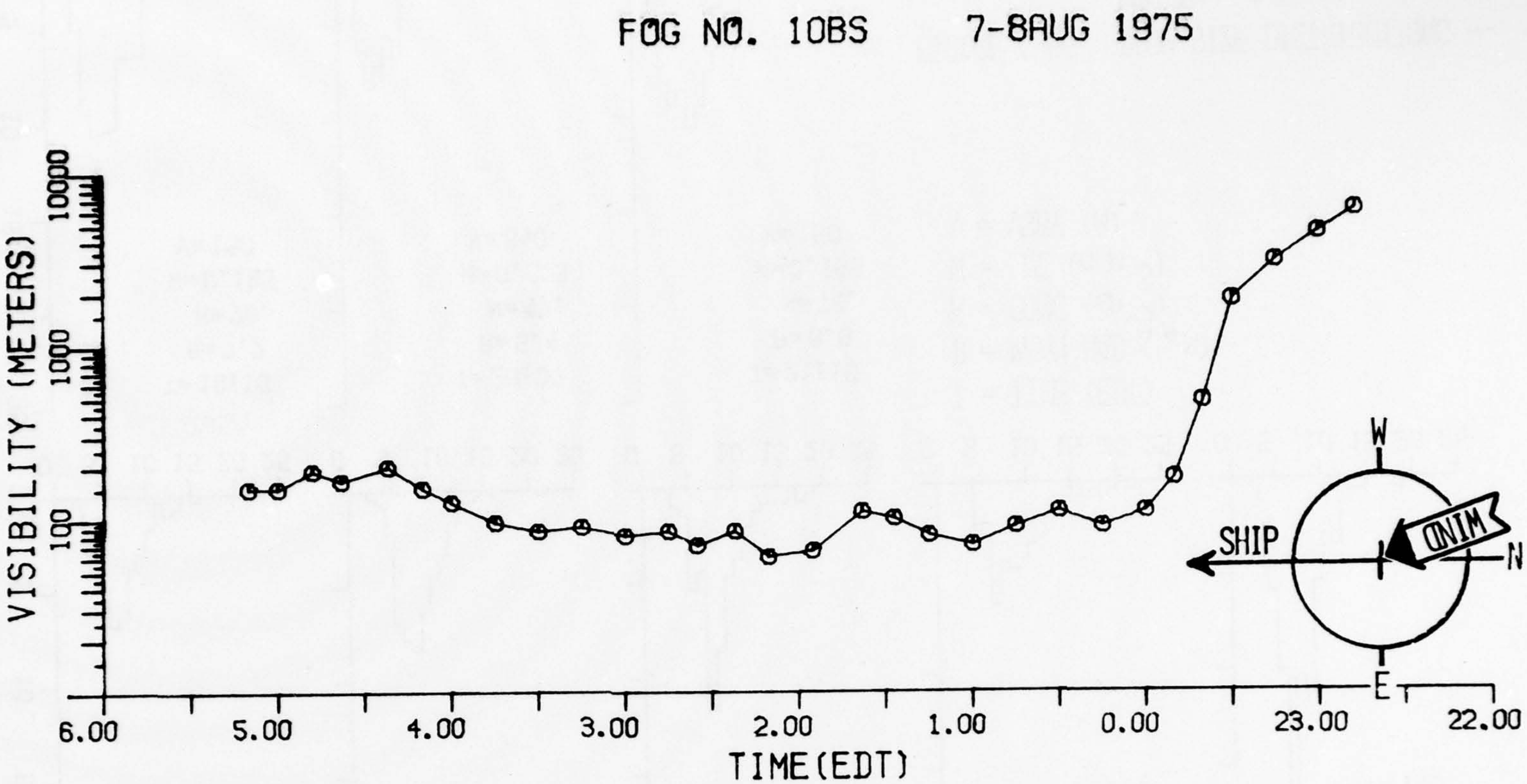


FIGURE A-67. VISIBILITY vs. TIME --
FOG 10B, 7-8 AUGUST 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

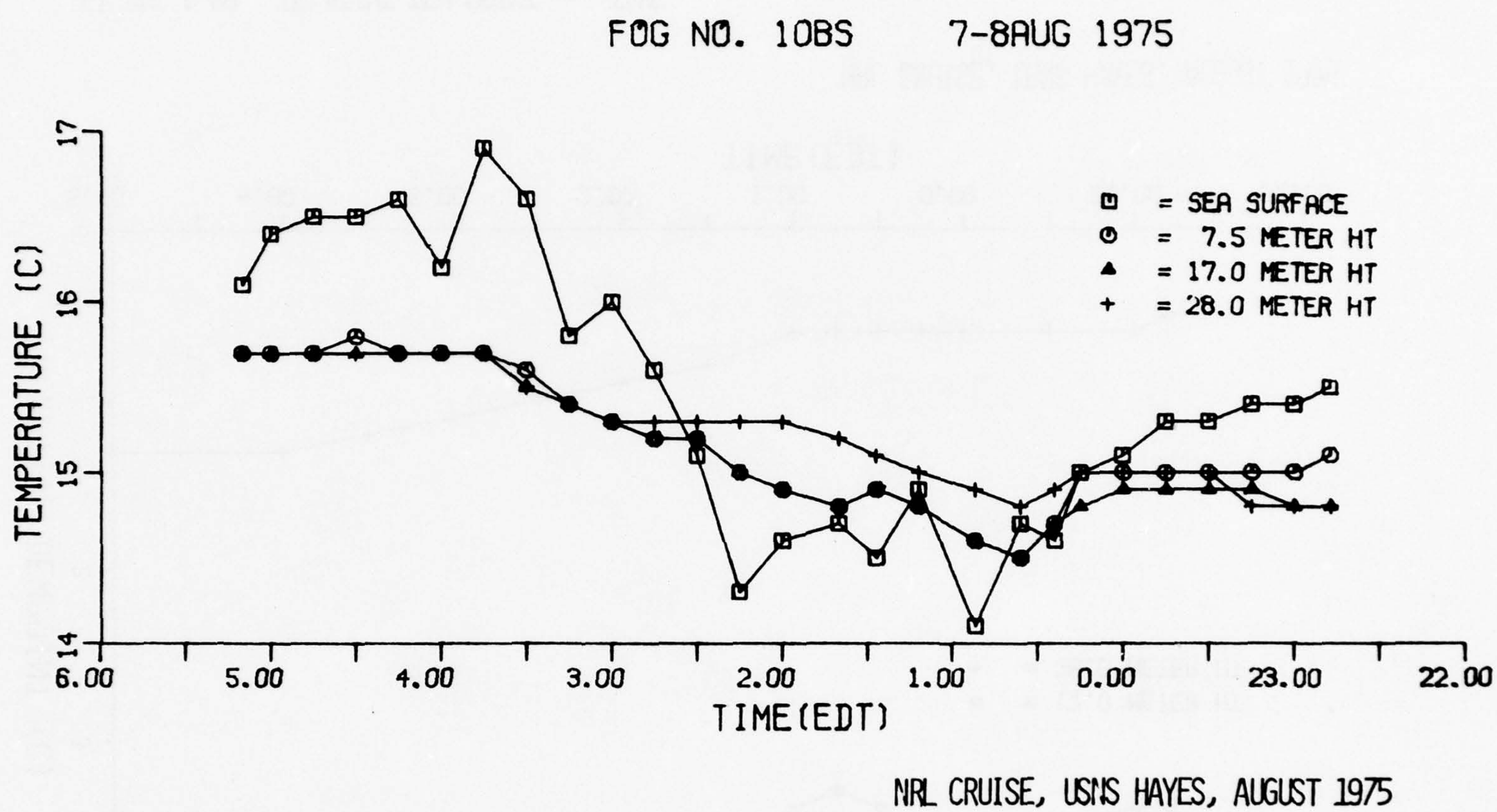
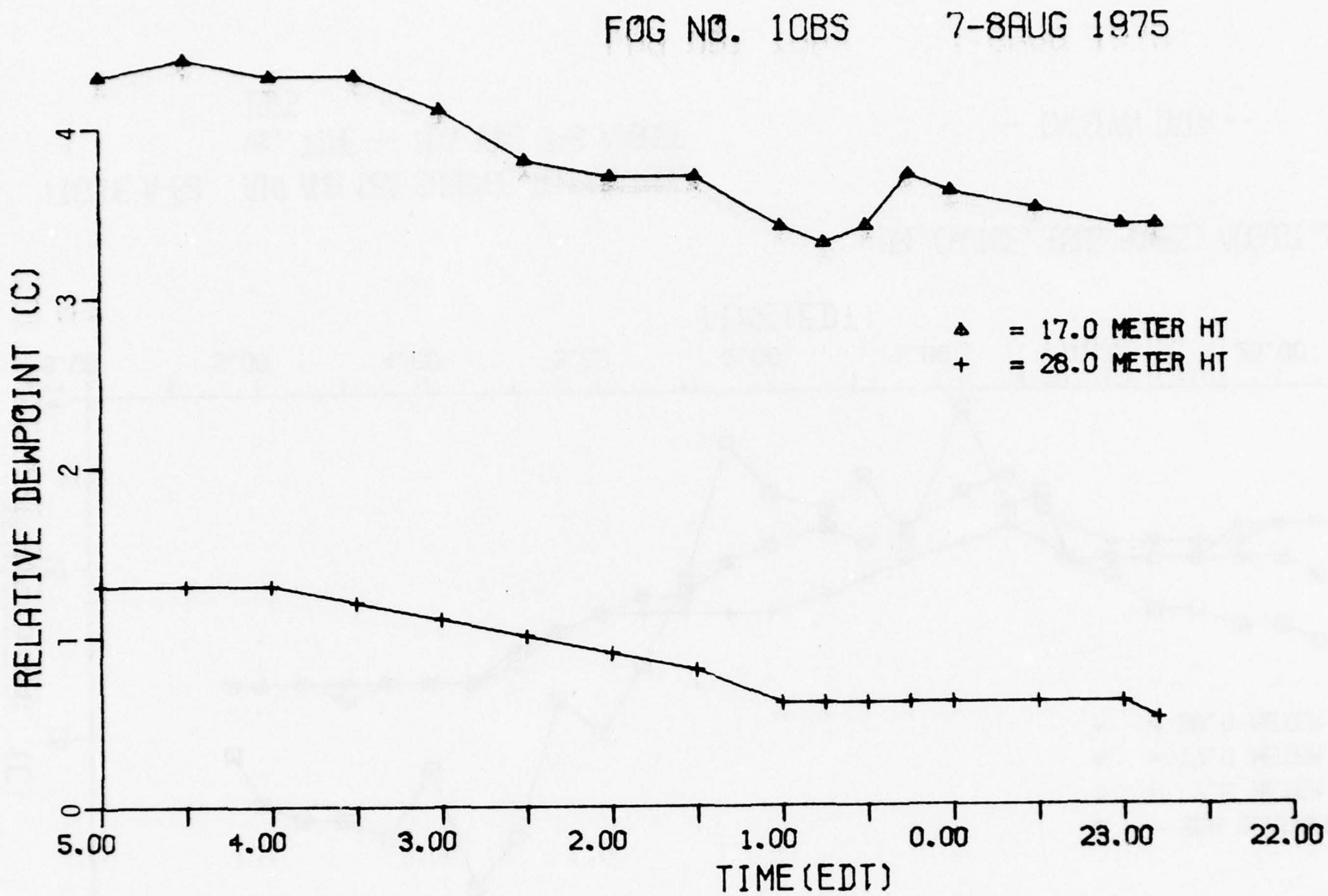


FIGURE A-68. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 10B, 7-8 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-69. RELATIVE DEW POINT vs. TIME -- FOG 10B, 7-8 AUGUST 1975

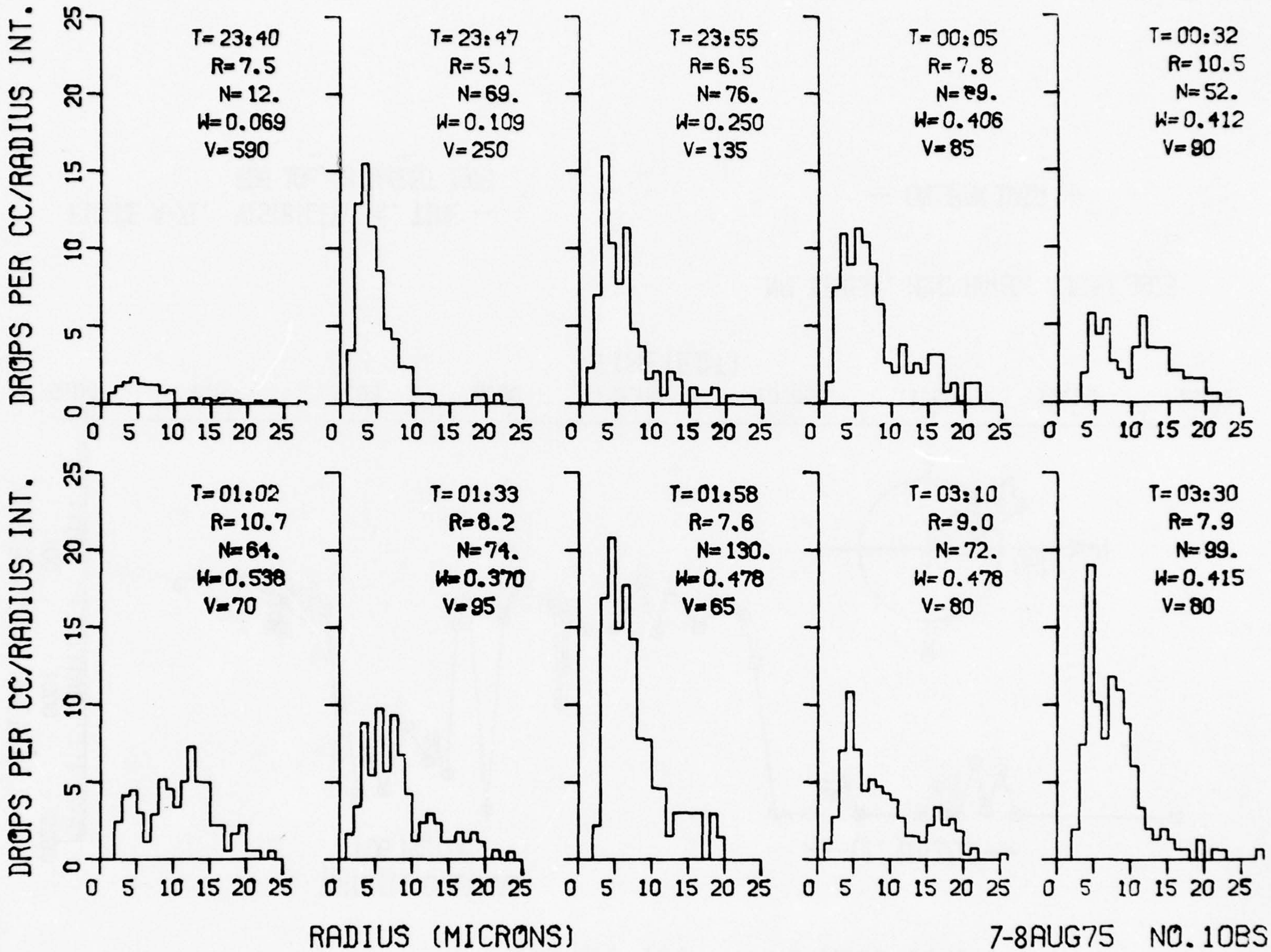
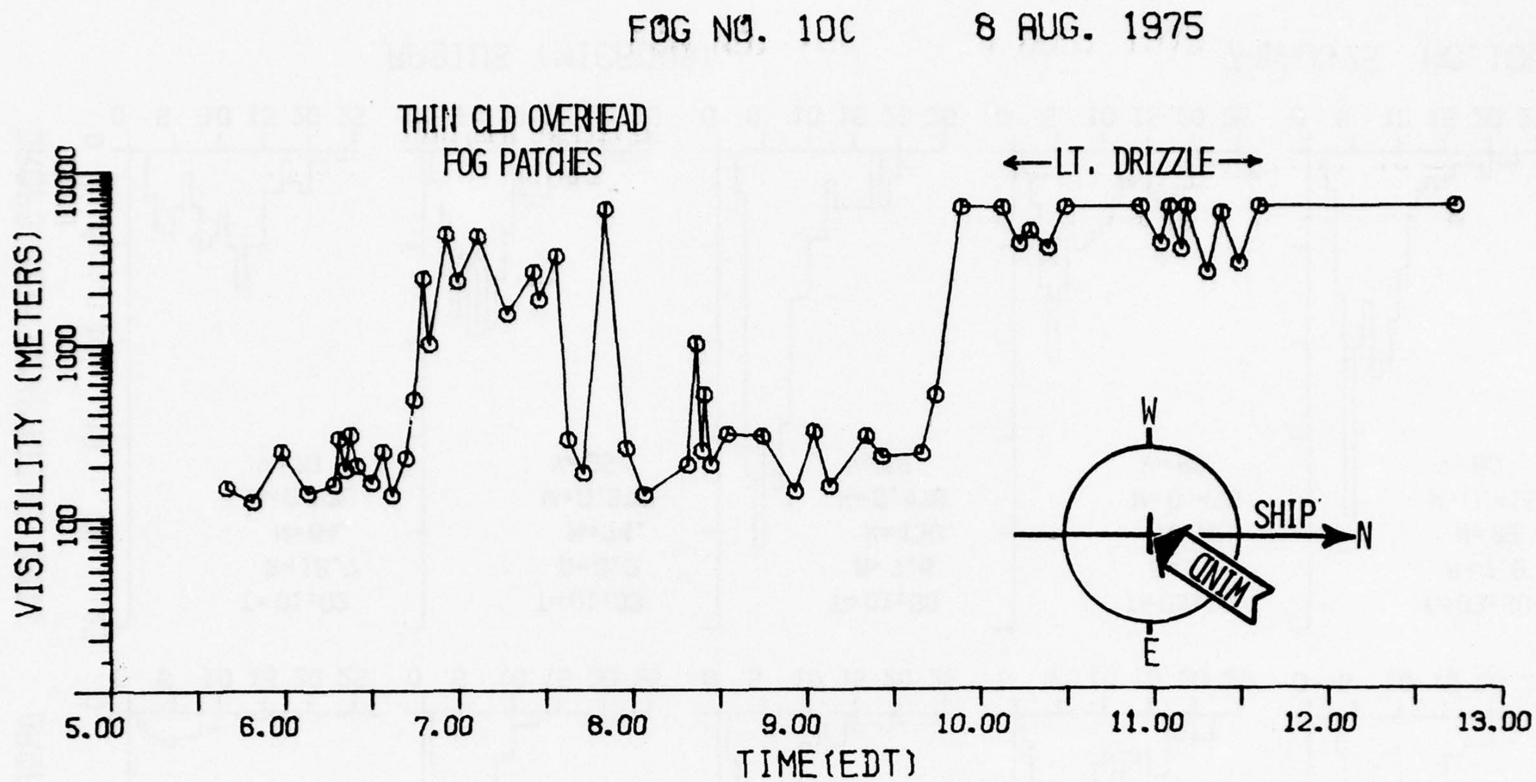


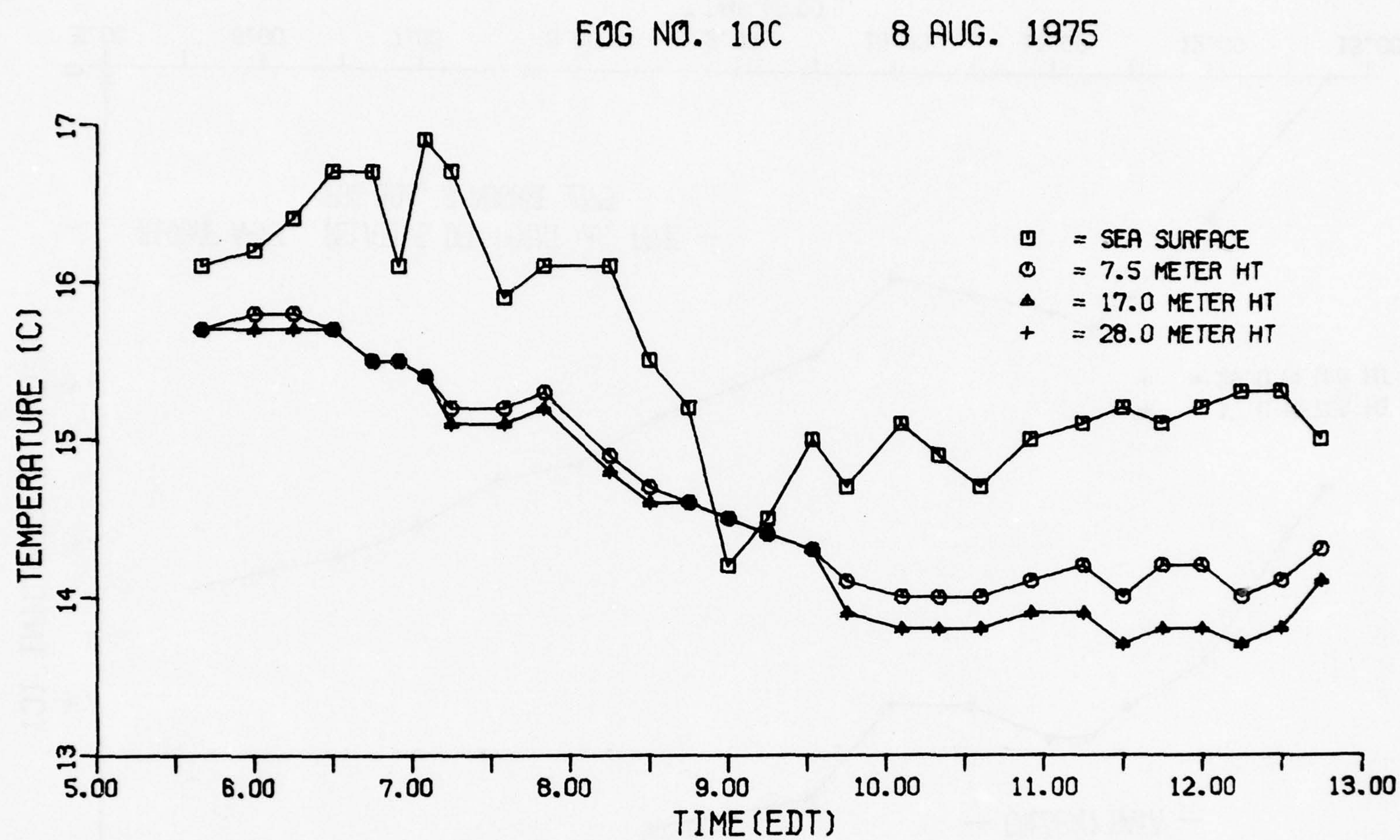
FIGURE A-70. DROP SIZE DISTRIBUTIONS -- FOG 10B, 7-8 AUGUST 1975 -- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-71. VISIBILITY vs. TIME --
FOG 10c, 8 AUGUST 1975

-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-72. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 10c, 8 AUGUST 1975

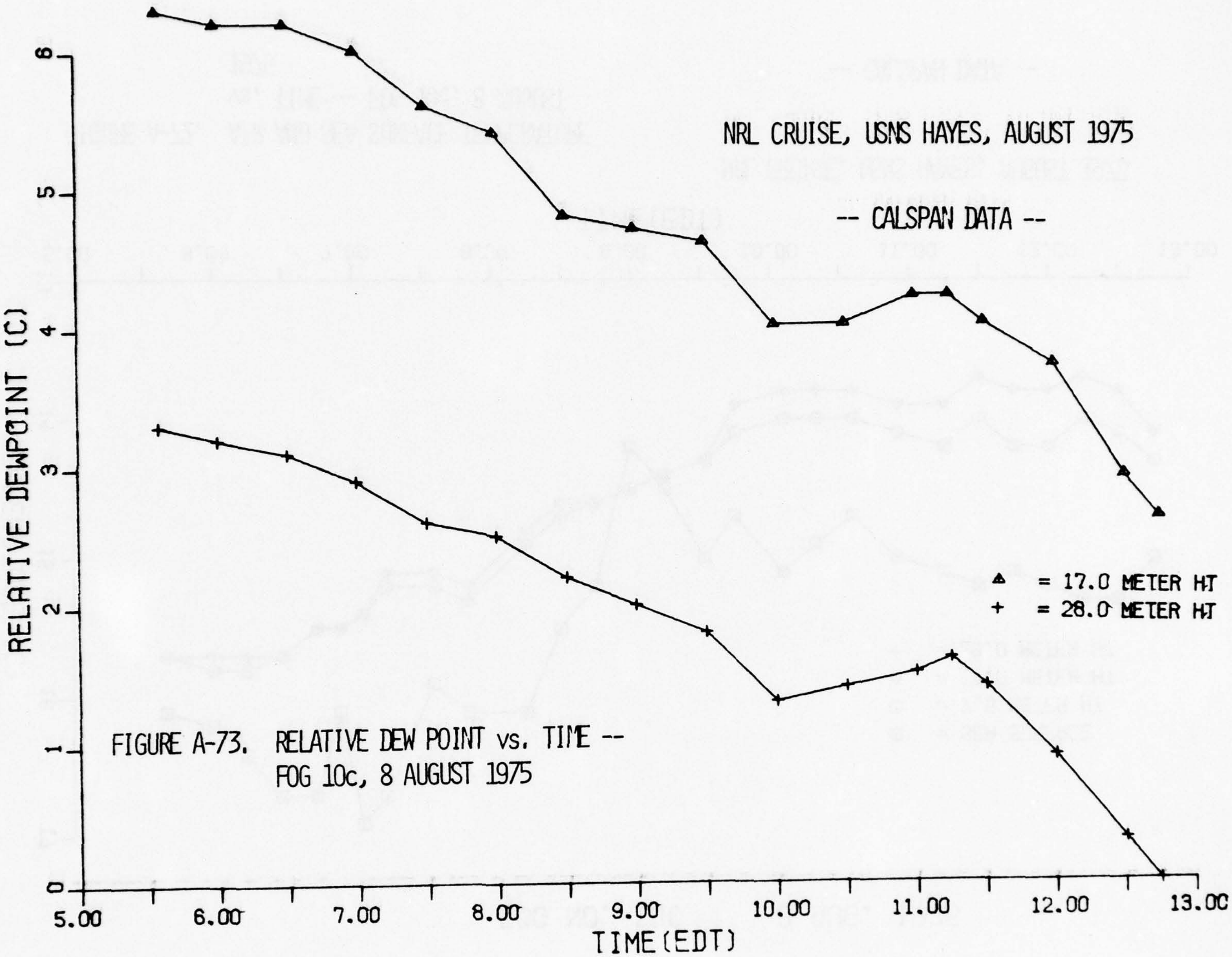
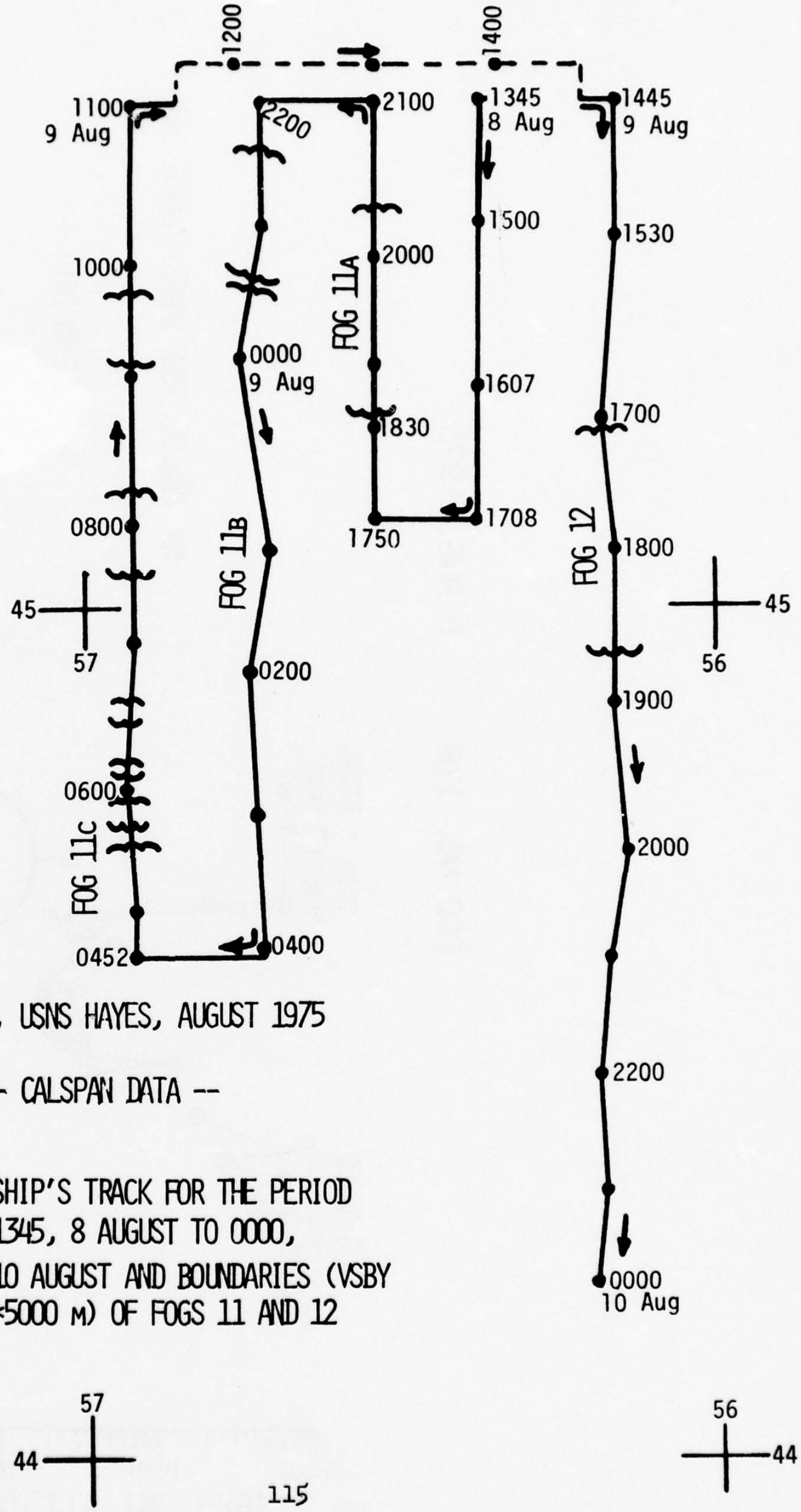


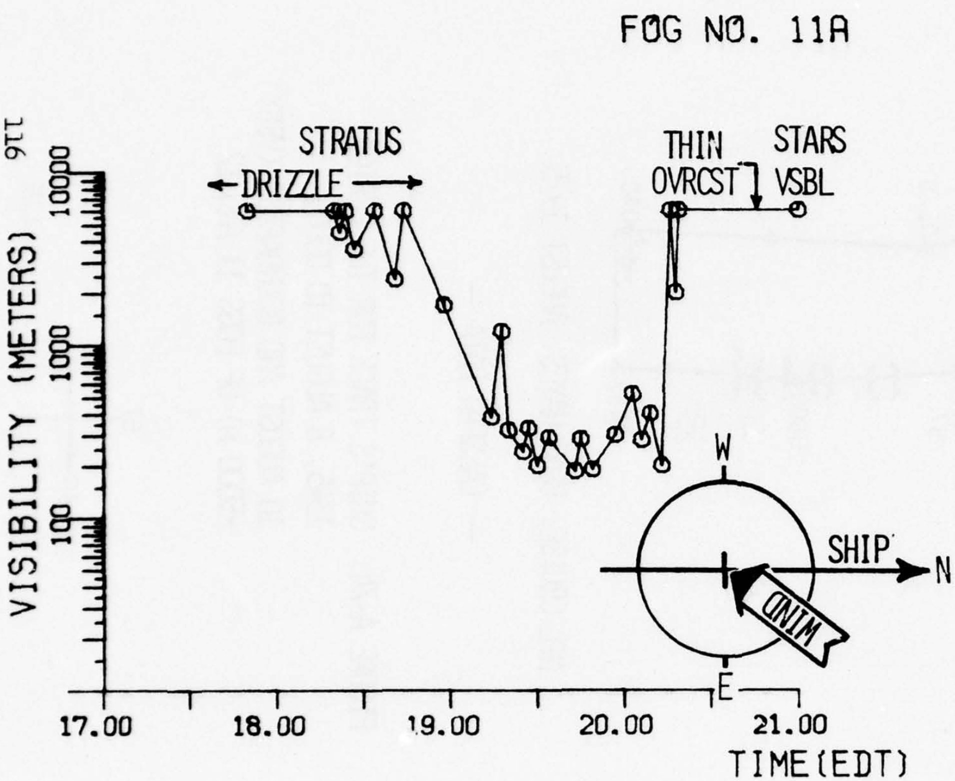
FIGURE A-73. RELATIVE DEW POINT vs. TIME -- FOG 10c, 8 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-74. SHIP'S TRACK FOR THE PERIOD 1345, 8 AUGUST TO 0000, 10 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOGS 11 AND 12



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-75. VISIBILITY vs. TIME -- FOG 11A, 8 AUGUST 1975

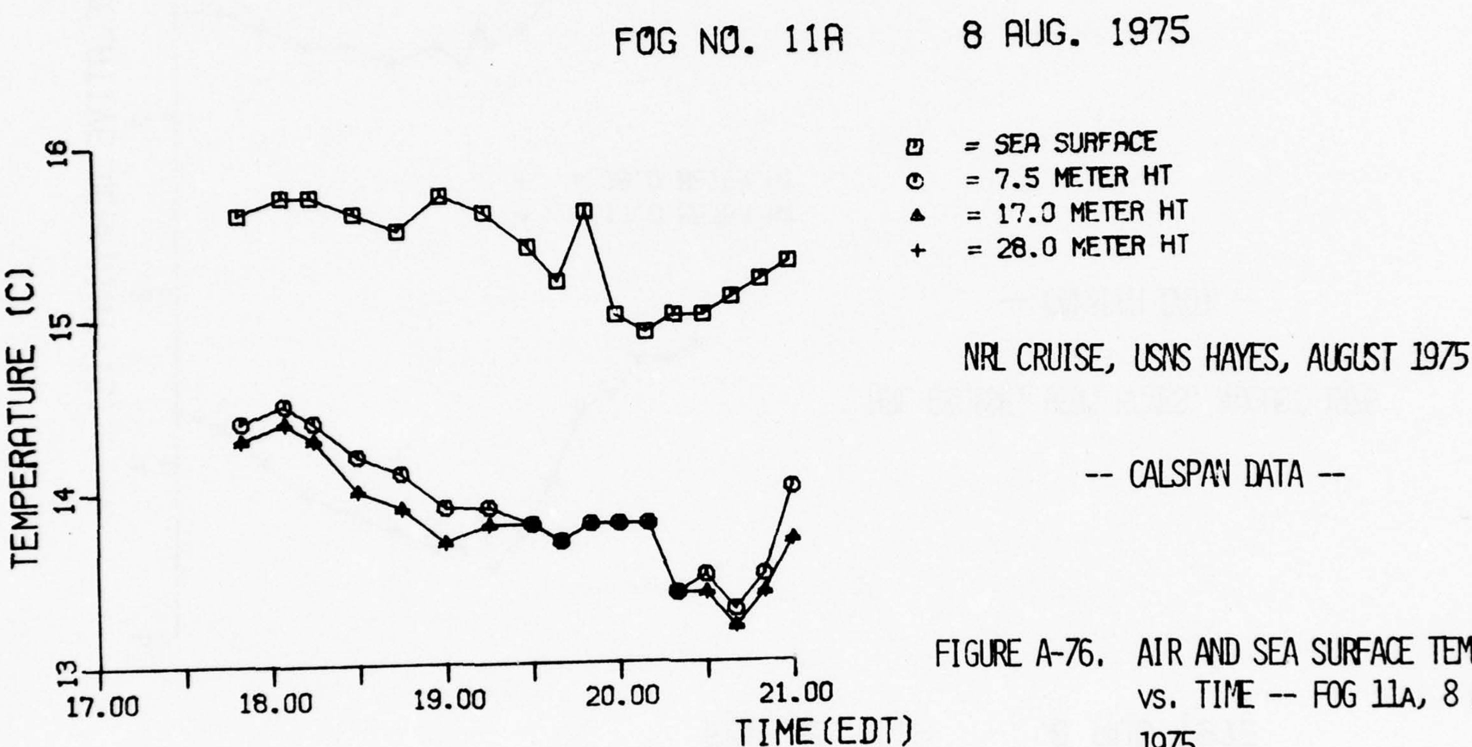


FIGURE A-76. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 11A, 8 AUGUST 1975

FOG NO. 11A   8 AUG 1975

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

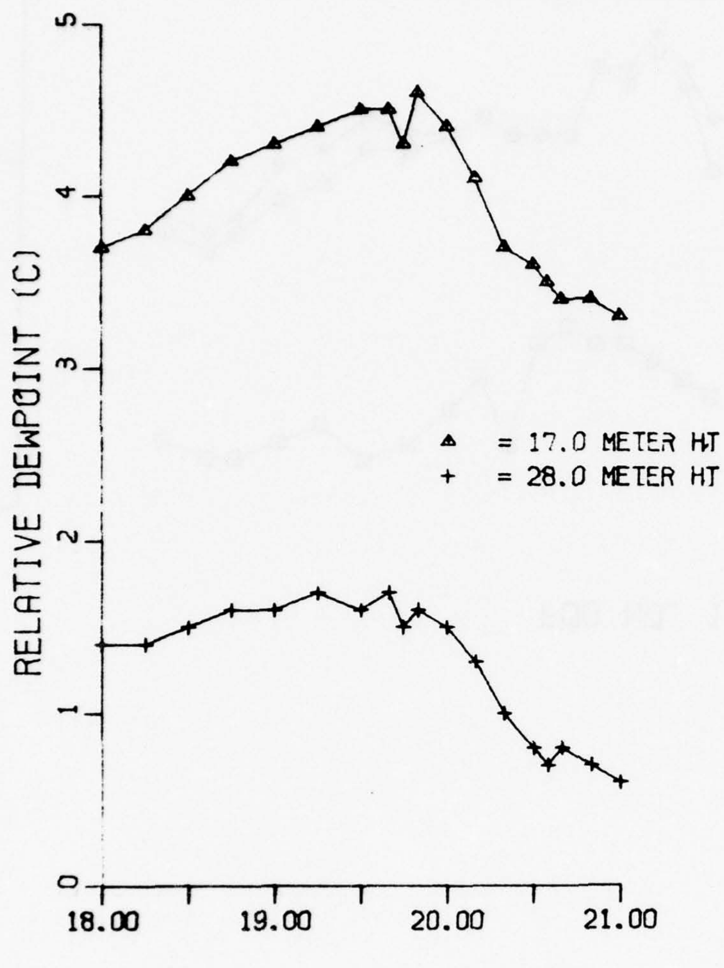
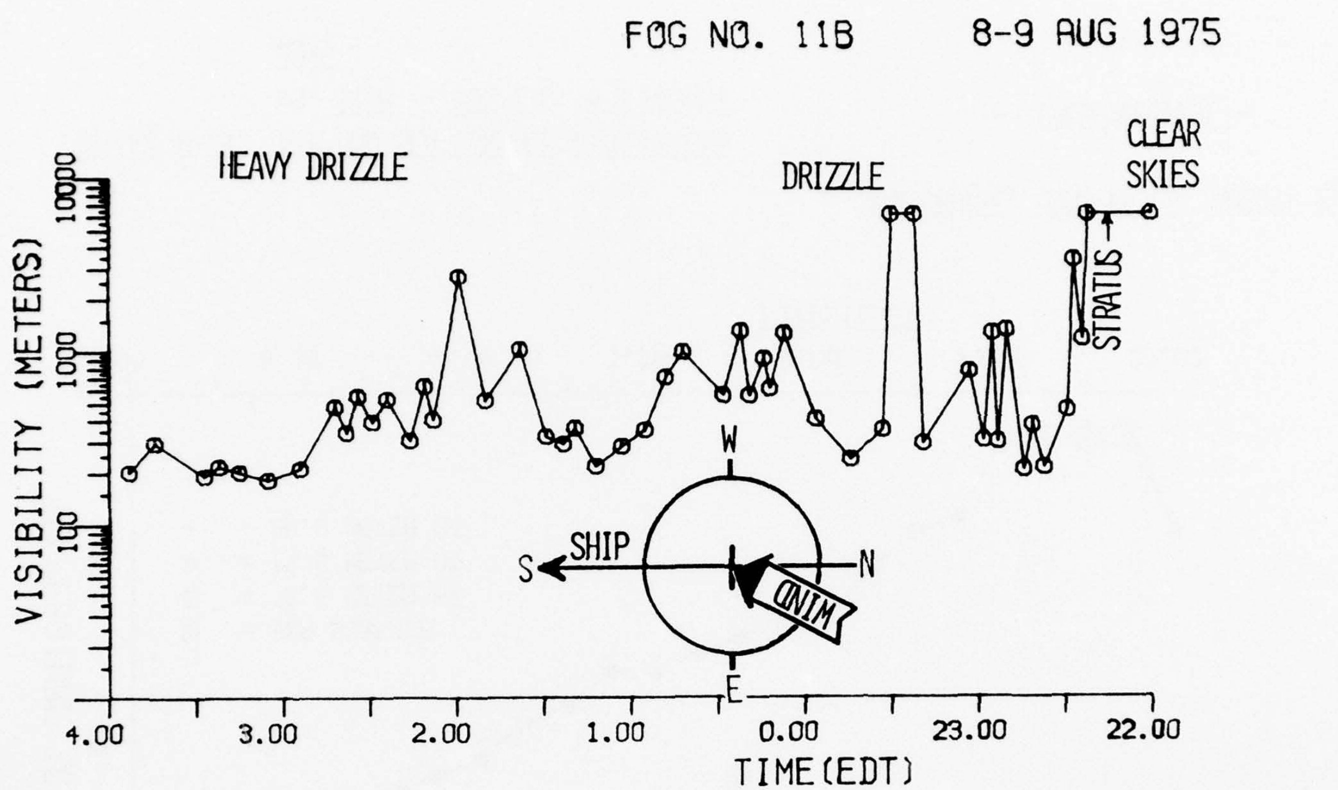


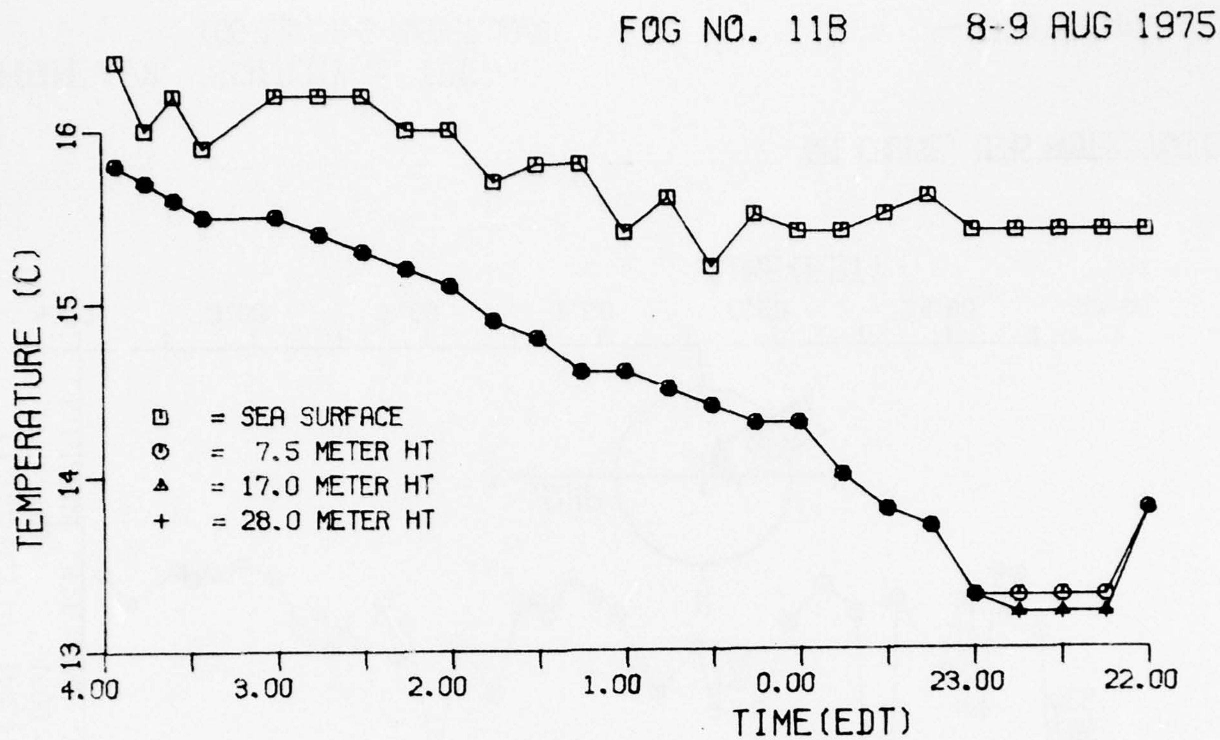
FIGURE A-77. RELATIVE DEW POINT vs. TIME--
FOG 11A, 8 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-78. VISIBILITY vs. TIME --
FOG 11B, 8-9 AUGUST 1975

-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-79. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 11B, 8-9 AUGUST 1975

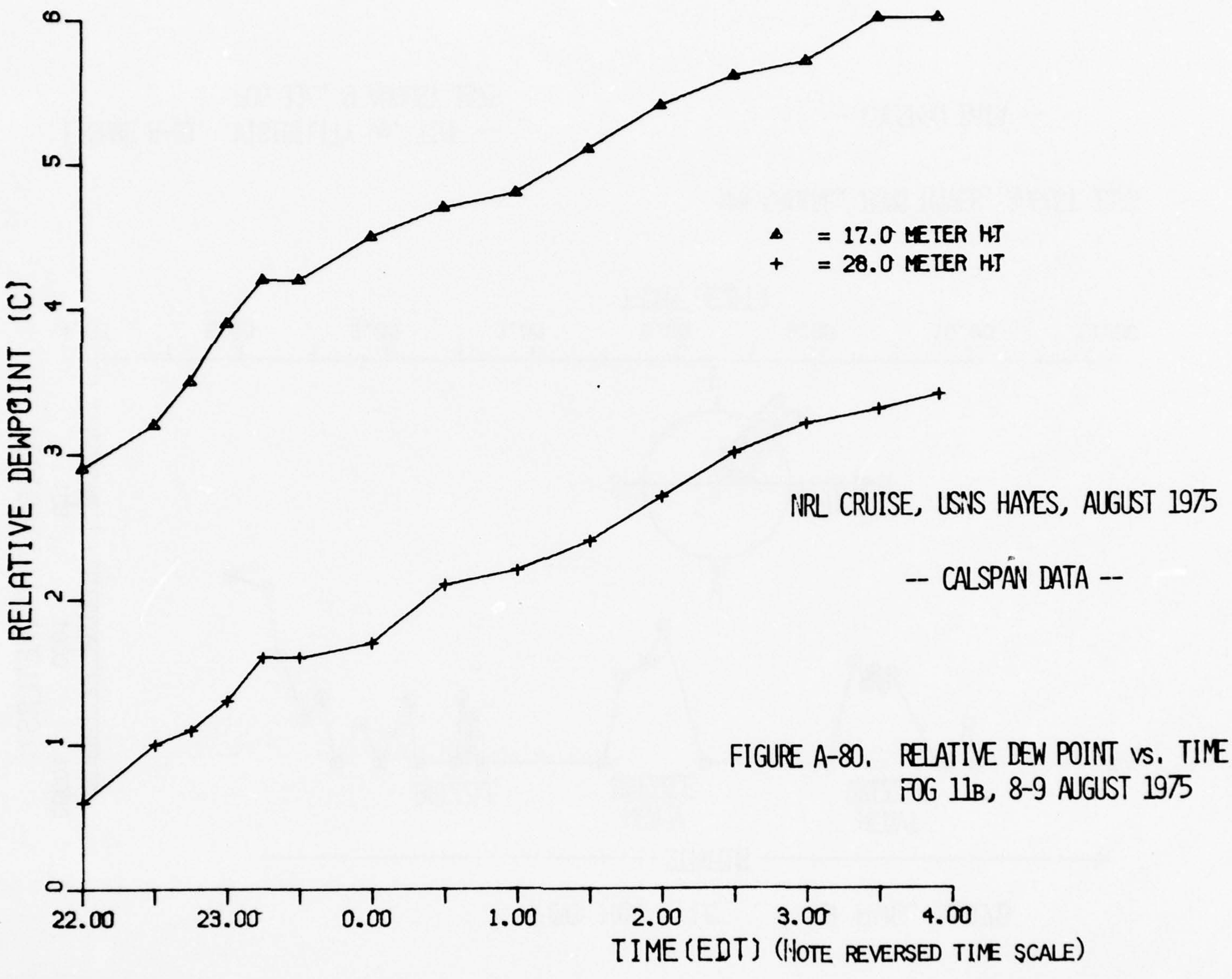
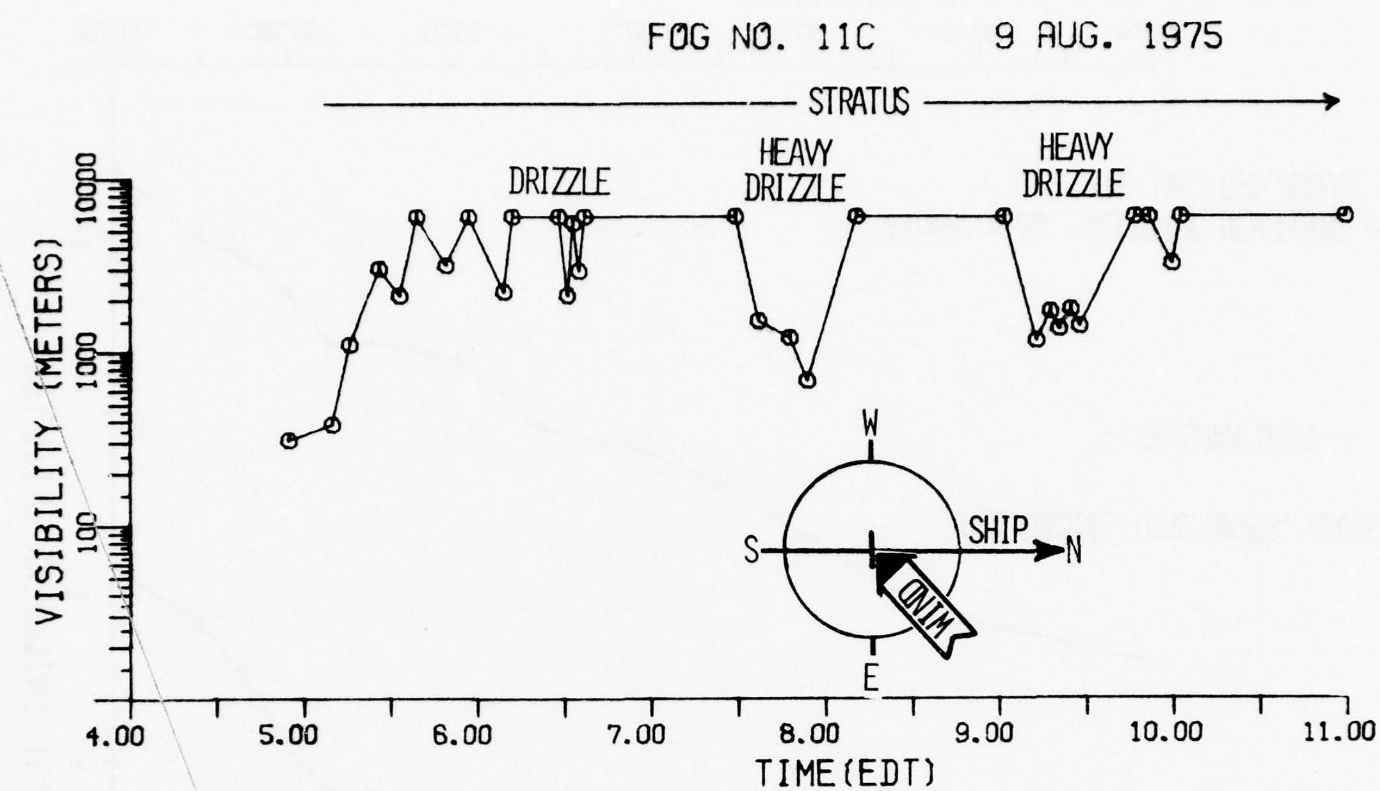


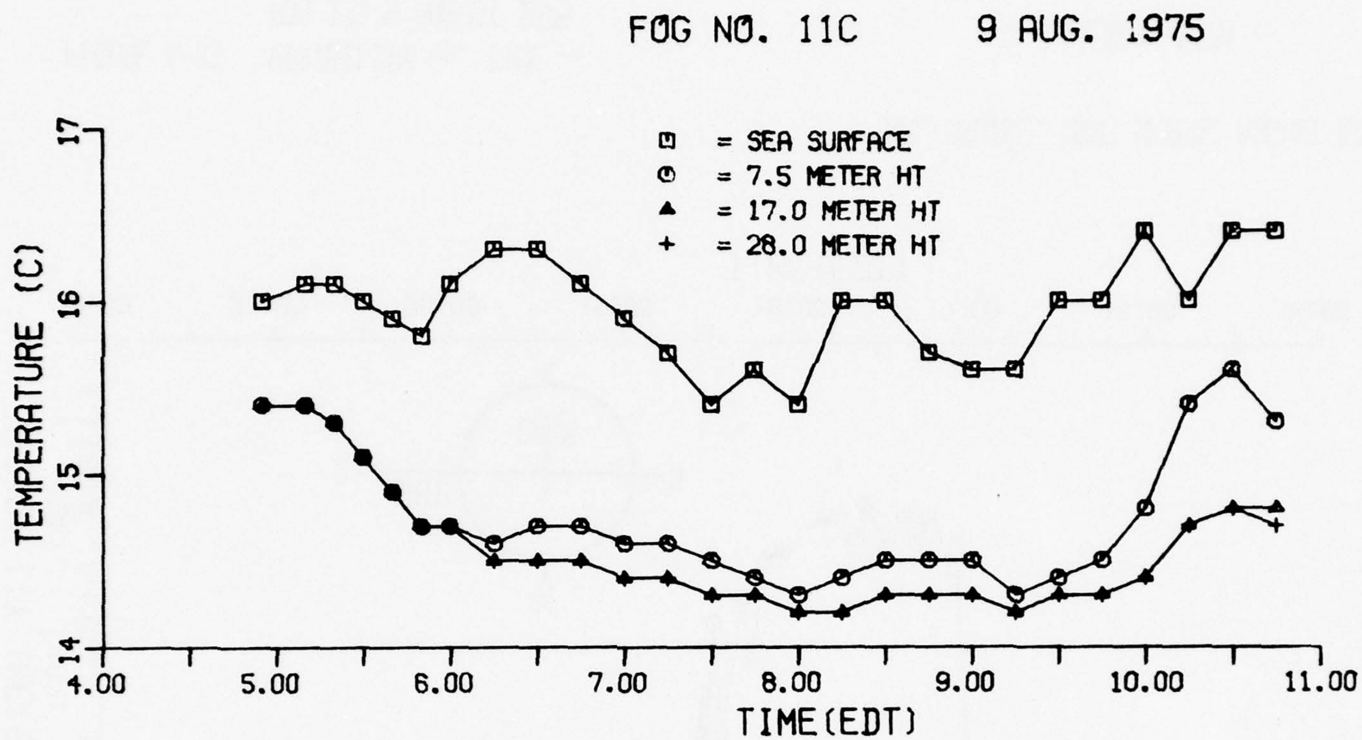
FIGURE A-80. RELATIVE DEW POINT vs. TIME -- FOG 11B, 8-9 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-81. VISIBILITY vs. TIME --
FOG 11c, 9 AUGUST 1975

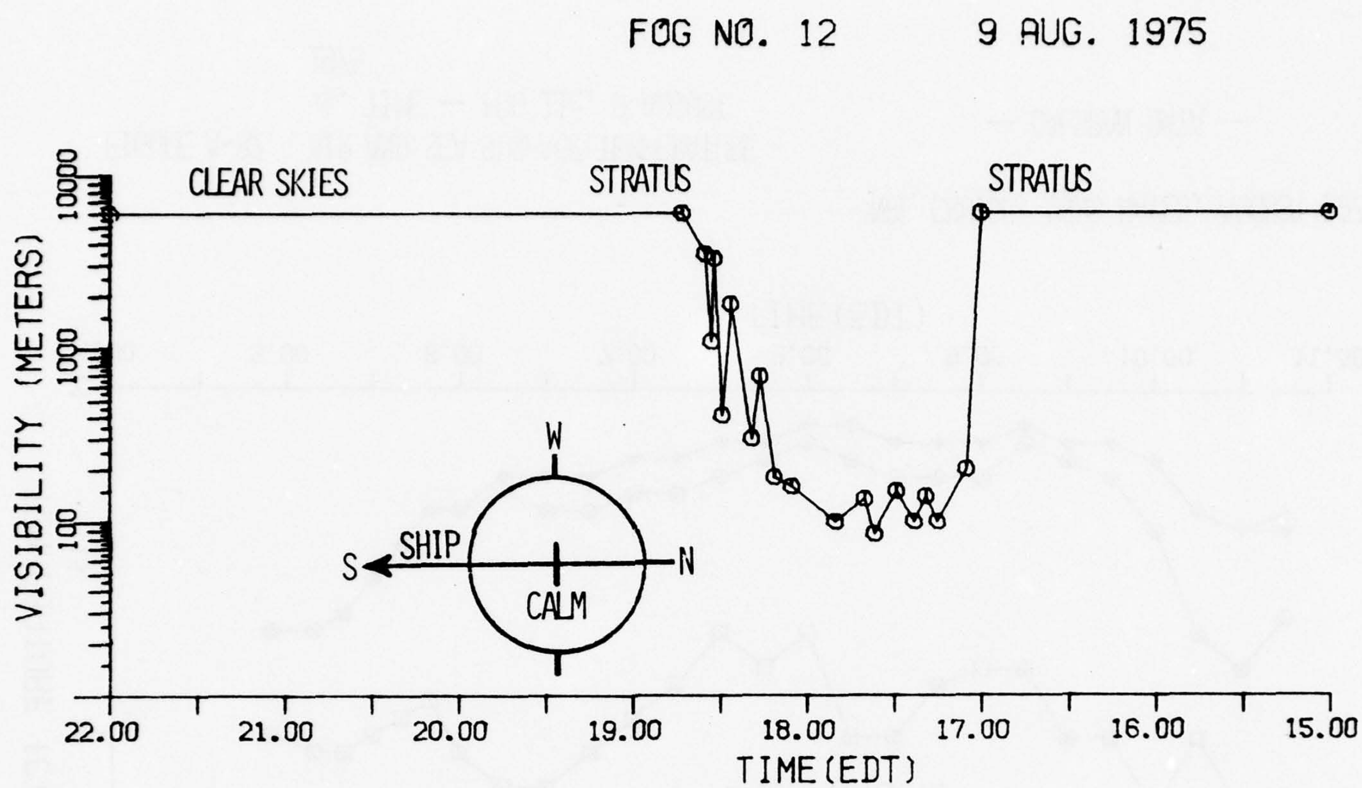
-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

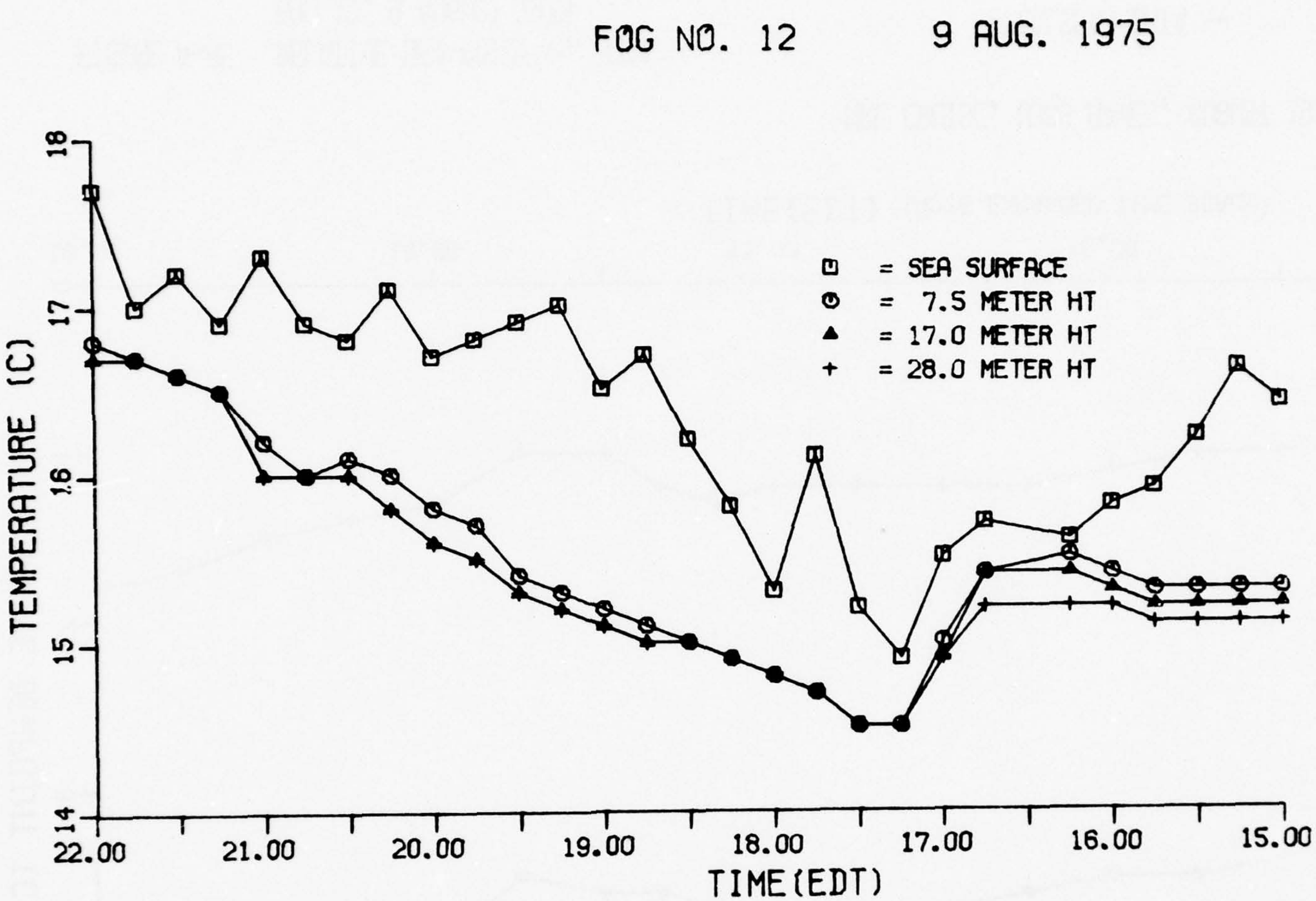
FIGURE A-82. AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 11c, 9 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-83 VISIBILITY vs. TIME --
FOG 12, 9 AUGUST 1975

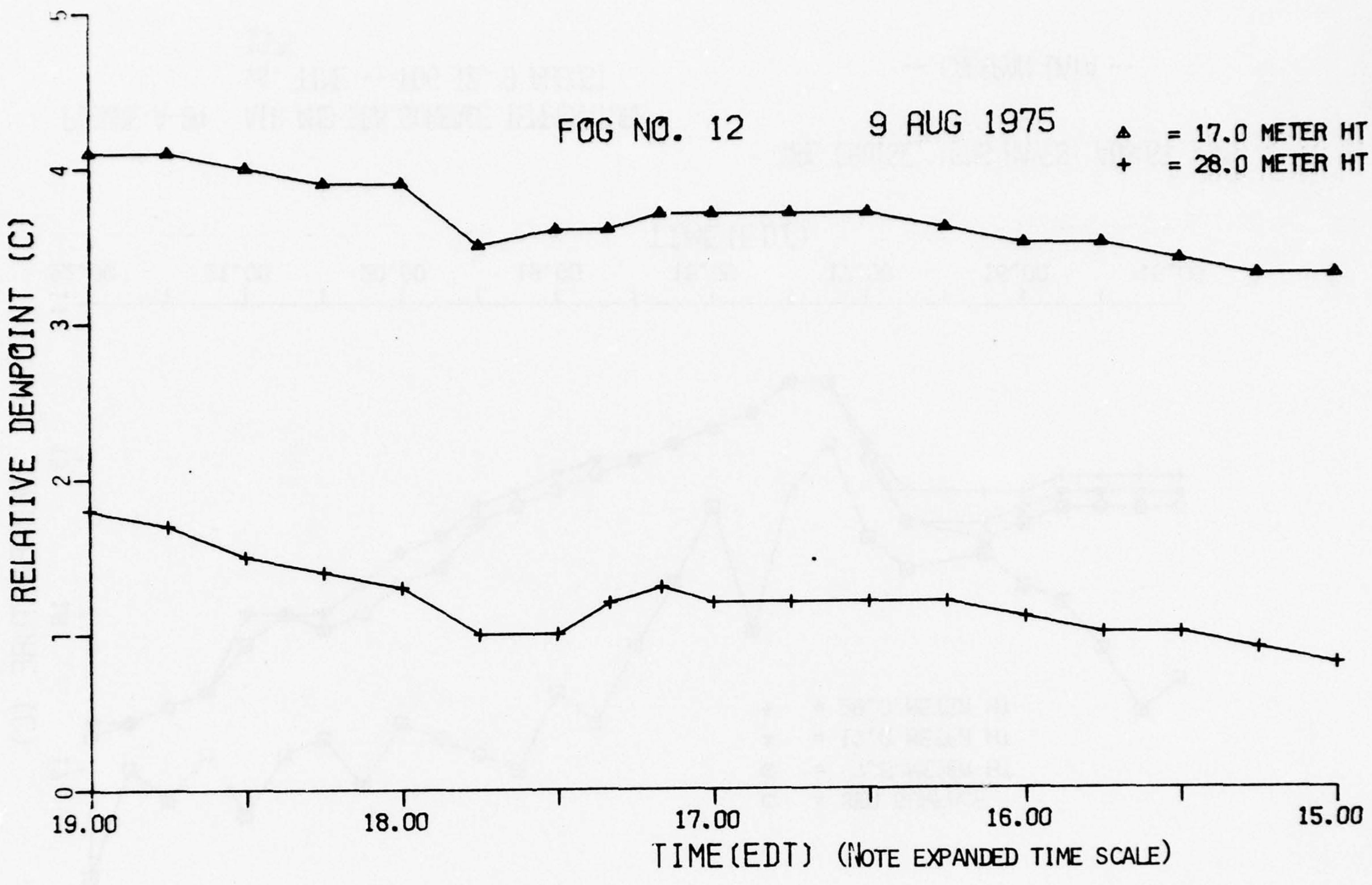
-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-84 AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 12, 9 AUGUST 1975

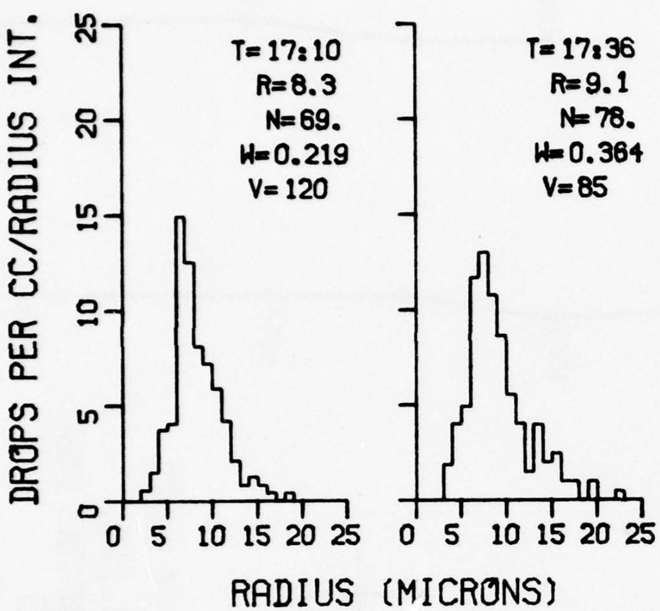
-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-85 RELATIVE DEW POINT vs. TIME --
FOG 12, 9 AUGUST 1975

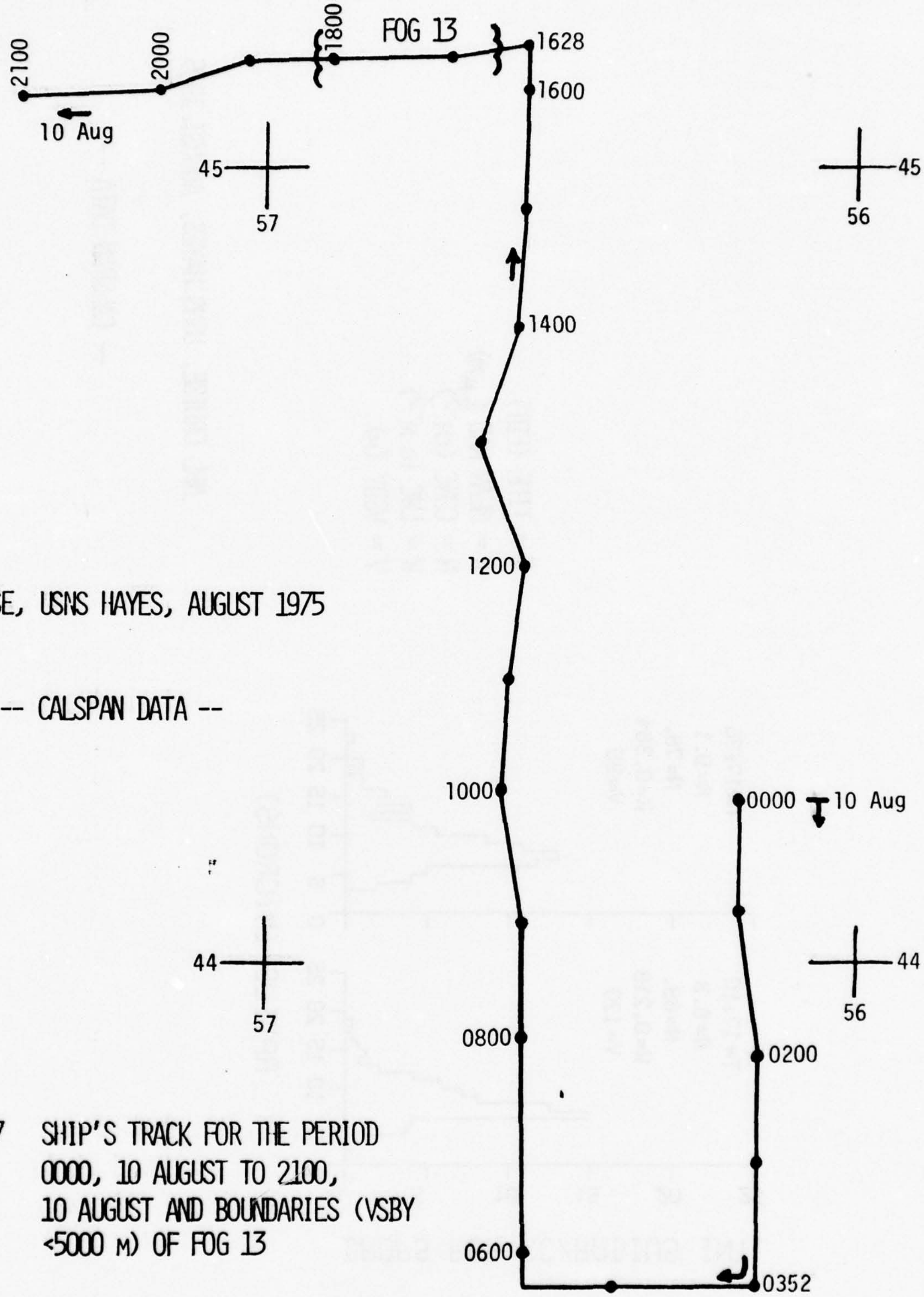


T = TIME (EDT)
R = MEAN RAD (μM)
N = CONC (CM^{-3})
W = LWC ($G\ M^{-3}$)
V = VSBY (M)

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

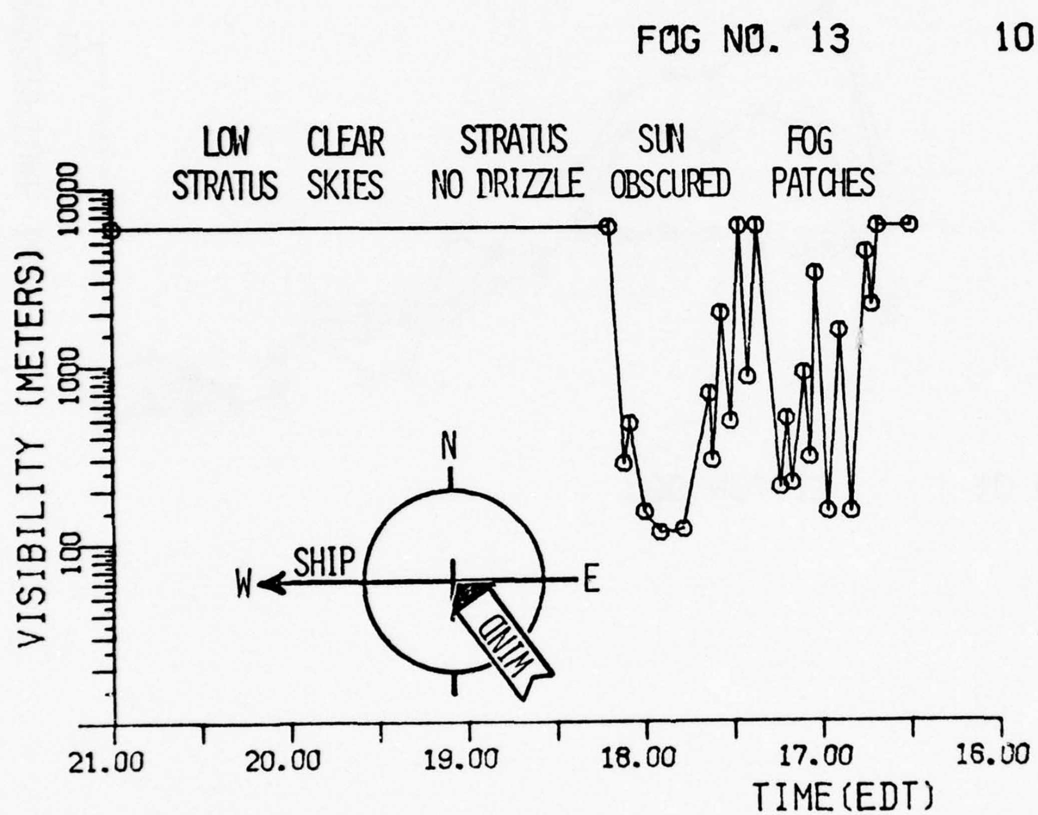
FIGURE A-36 DROP SIZE DISTRIBUTIONS -- FOG 12, 9 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

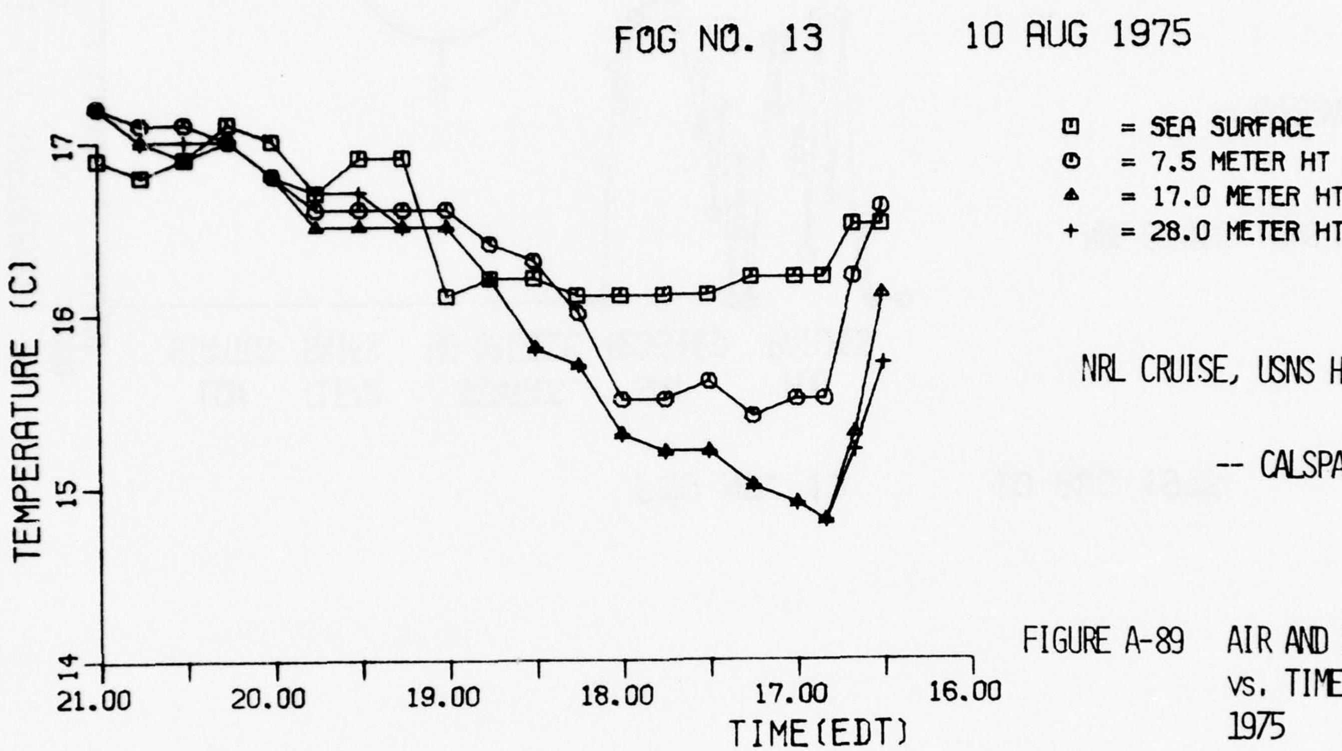
FIGURE A-87 SHIP'S TRACK FOR THE PERIOD 0000, 10 AUGUST TO 2100, 10 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 13



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

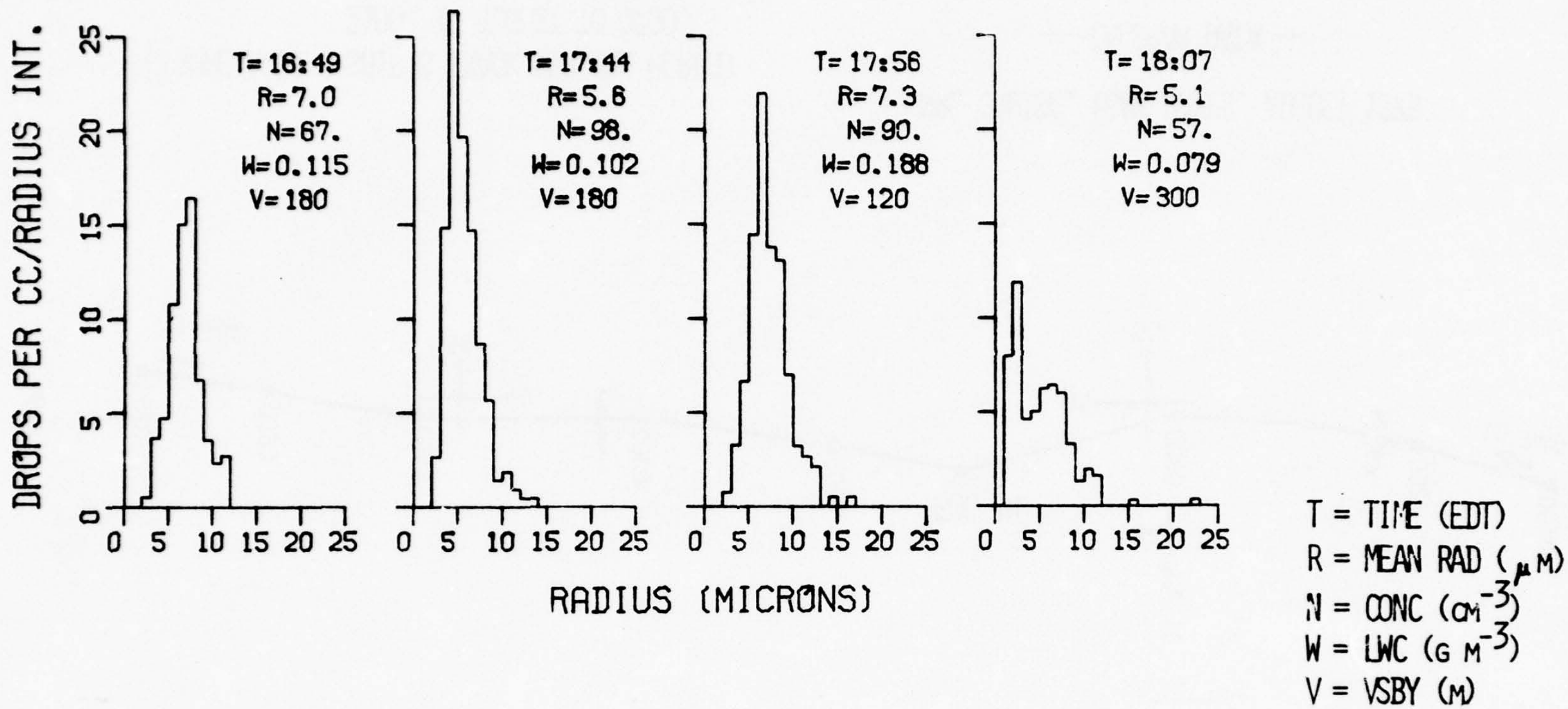
FIGURE A-88 VISIBILITY vs. TIME -- FOG 13, 10 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

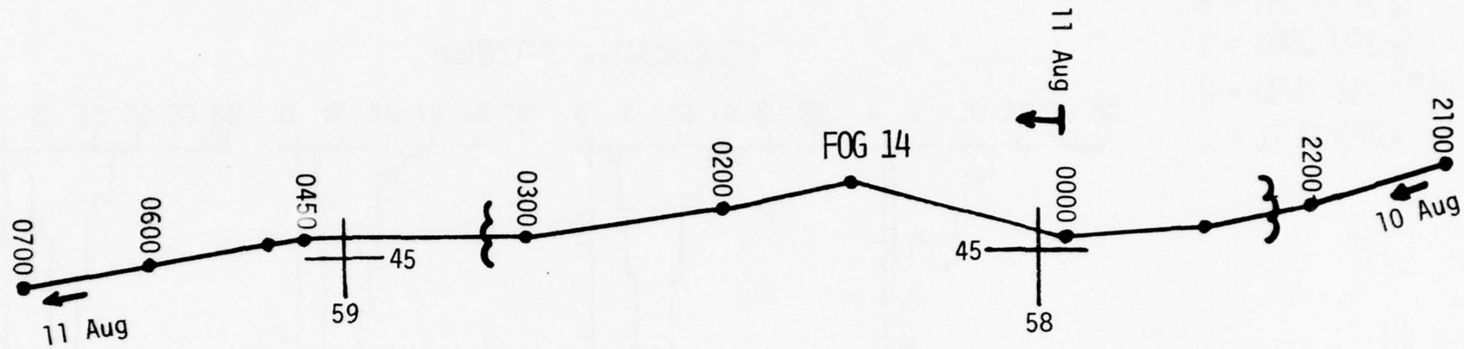
FIGURE A-89 AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 13, 10 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-90 DROP SIZE DISTRIBUTIONS --
FOG 13, 10 AUGUST 1975

-- CALSPAN DATA --

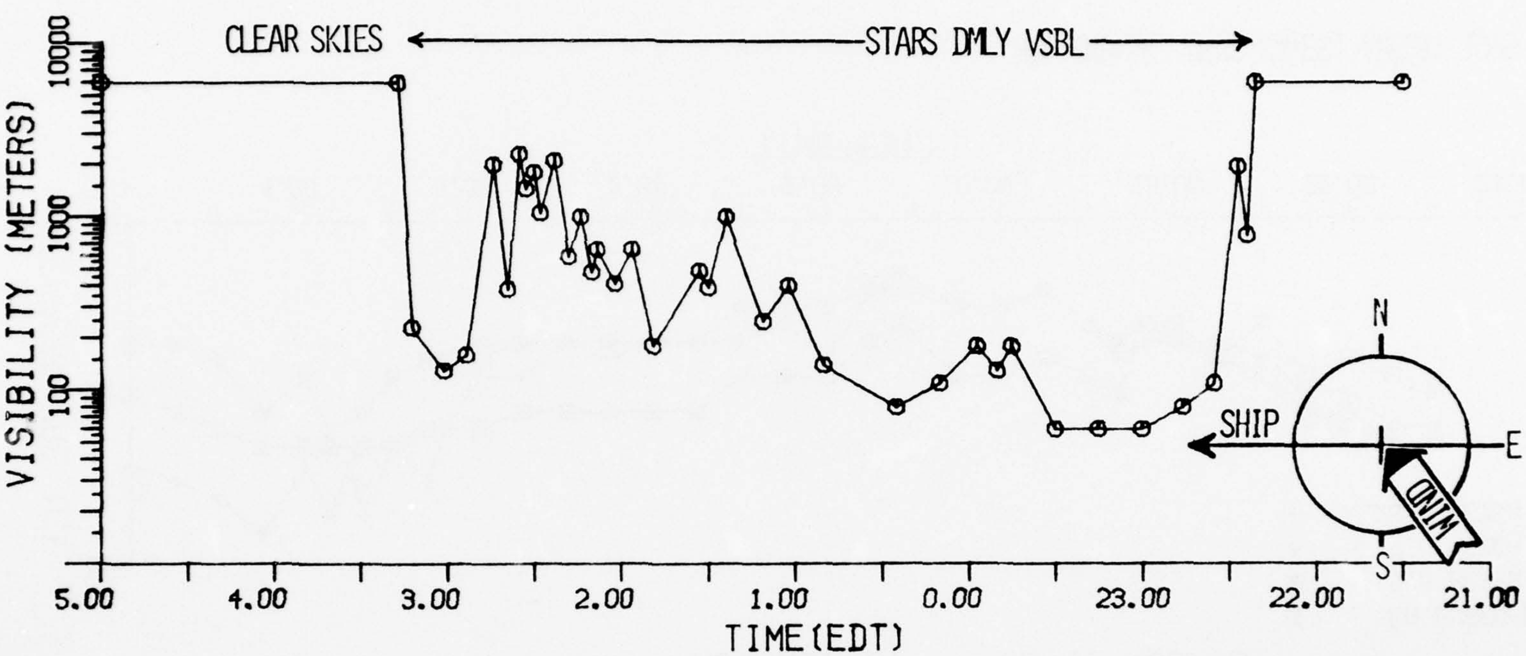


NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-91 SHIP'S TRACK FOR THE PERIOD 2100, 10 AUGUST TO 0700, 11 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 14

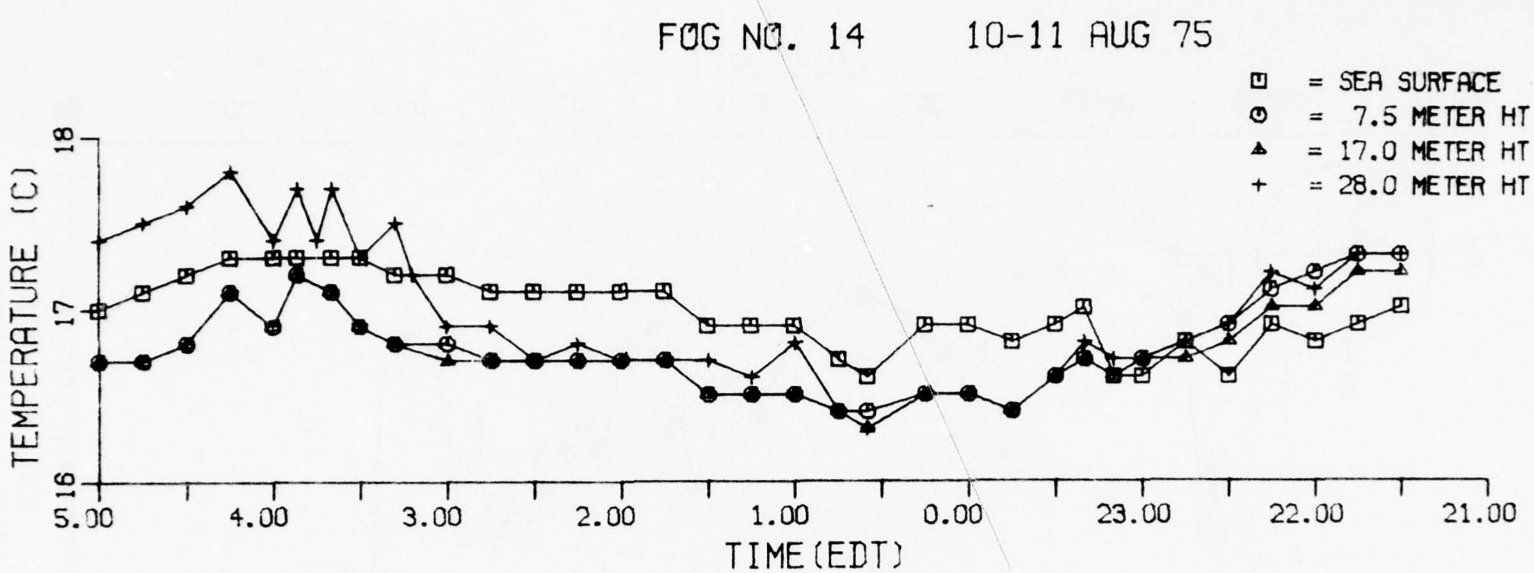
FOG NO. 14 10-11 AUG 75



NRL CRUISE, USNS HAYES, AUGUST 1975

FIGURE A-92 VISIBILITY vs. TIME --
FOG 14, 10-11 AUGUST 1975

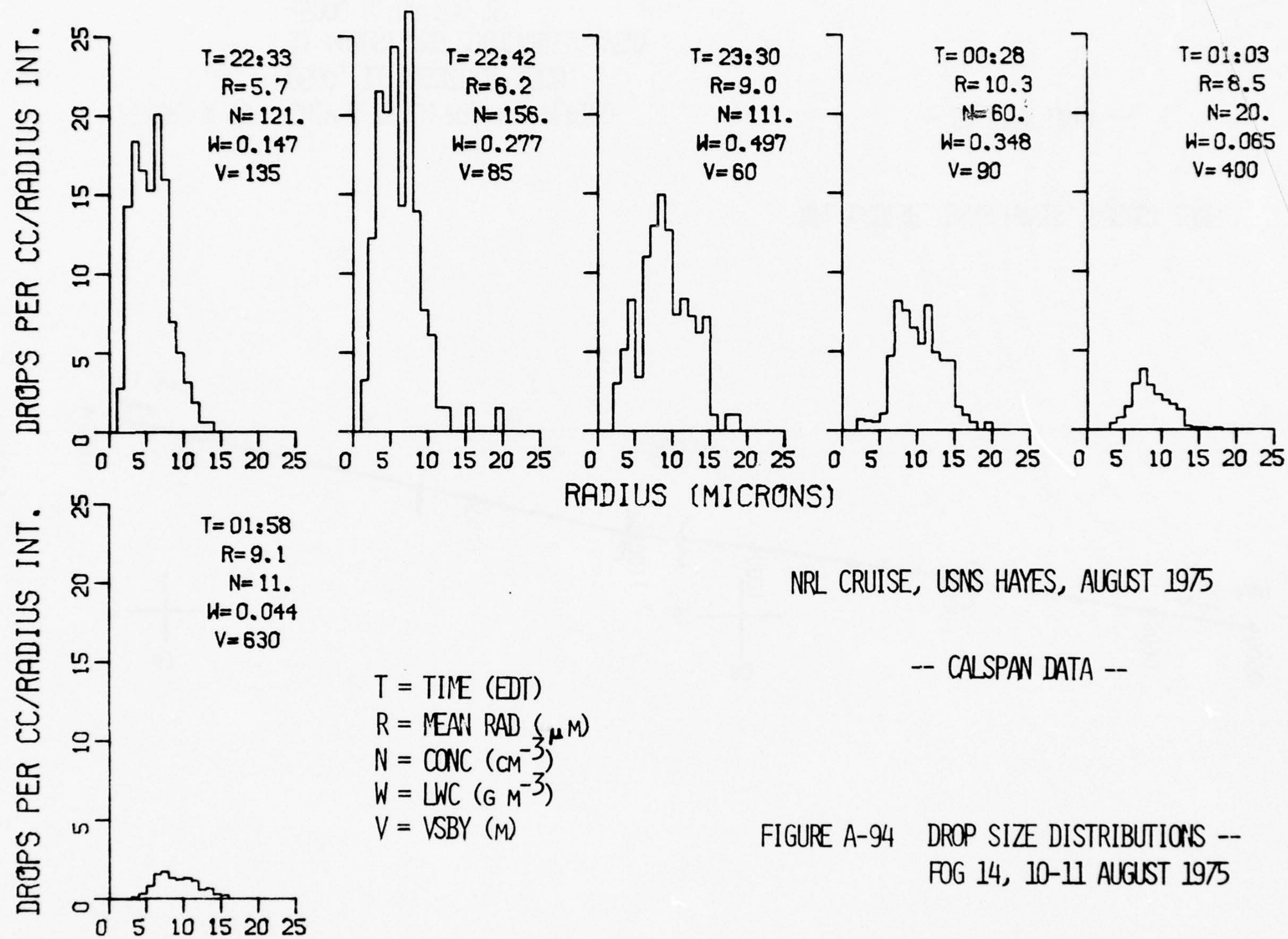
-- CALSPAN DATA --



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-93 AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 14, 10-11 AUGUST 1975

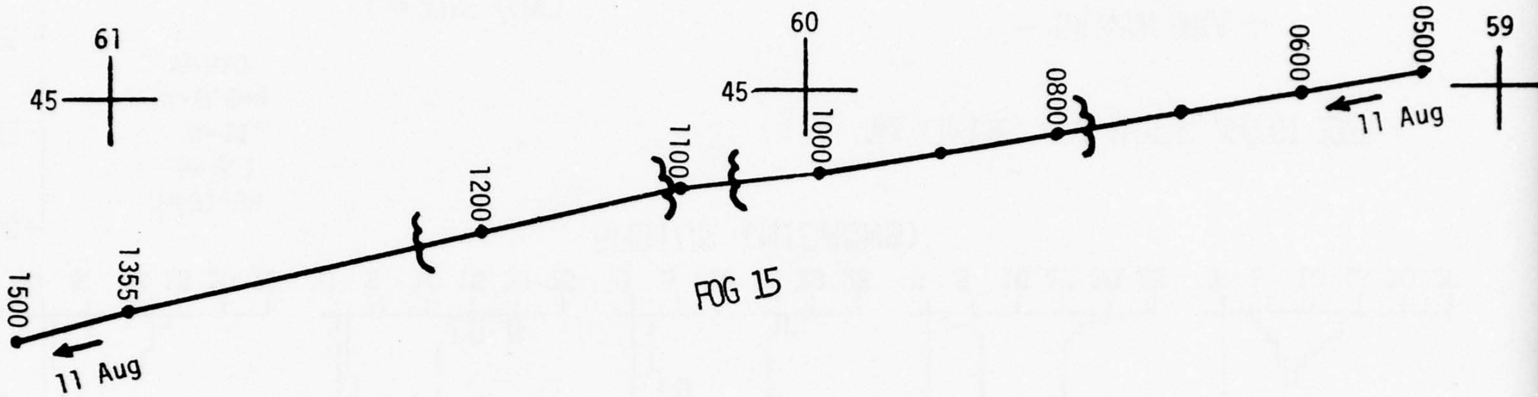


T = TIME (EDT)
R = MEAN RAD (μM)
N = CONC (CM^{-3})
W = LWC (G M^{-3})
V = VSBY (M)

NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

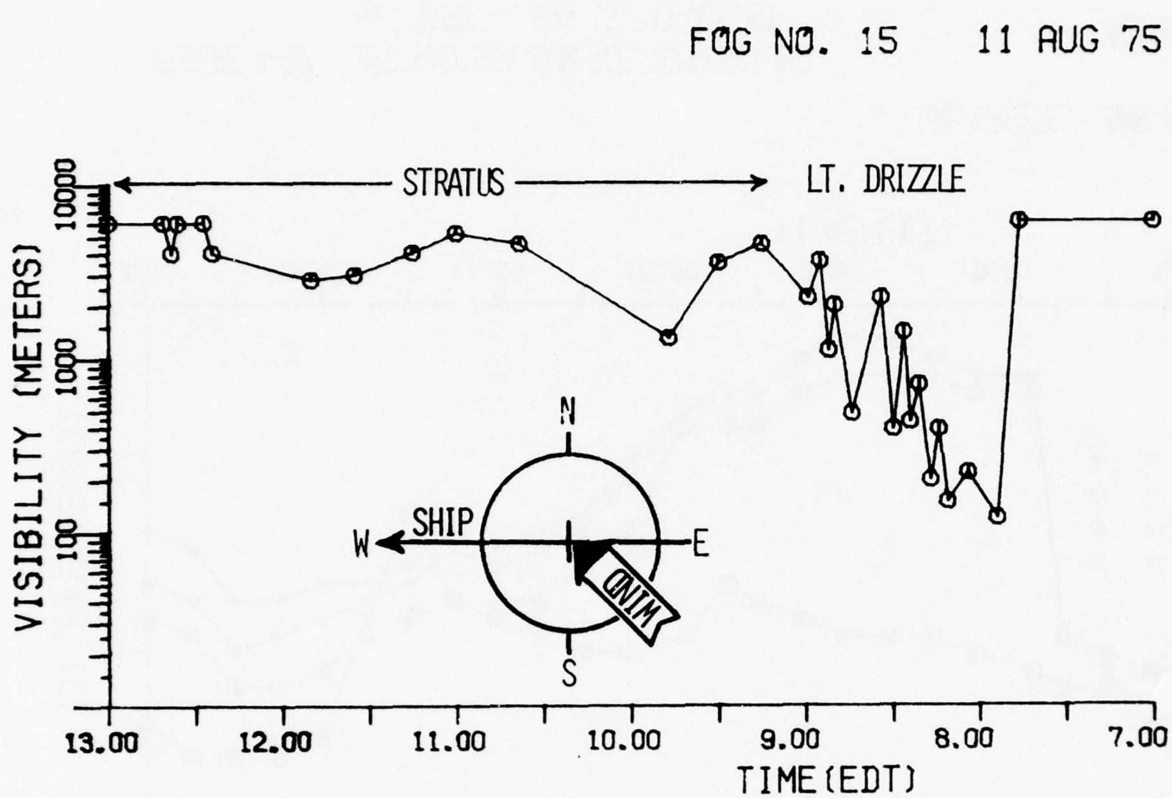
FIGURE A-94 DROP SIZE DISTRIBUTIONS -- FOG 14, 10-11 AUGUST 1975



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-95 SHIP'S TRACK FOR THE PERIOD 0500, 11 AUGUST TO 1500, 11 AUGUST AND BOUNDARIES (VSBY <5000 M) OF FOG 15

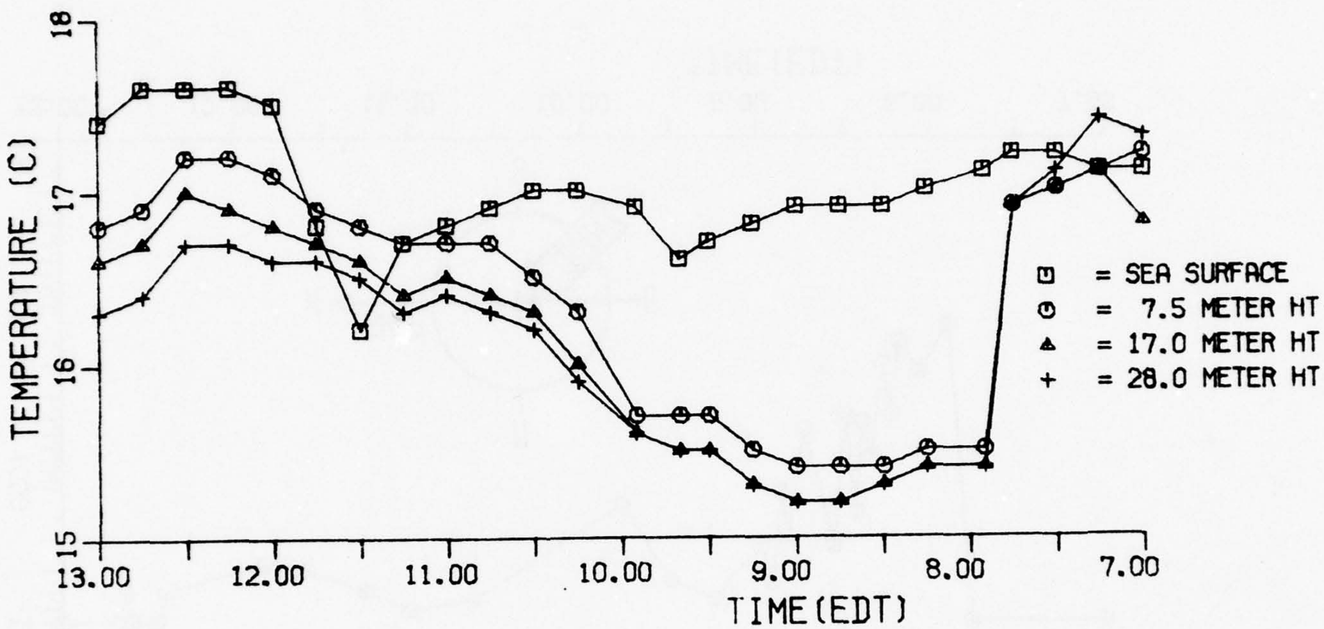


NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-96 VISIBILITY vs. TIME --
FOG 15, 11 AUGUST 1975

FØG NØ. 15   11 AUG 75



NRL CRUISE, USNS HAYES, AUGUST 1975

-- CALSPAN DATA --

FIGURE A-97 AIR AND SEA SURFACE TEMPERATURE vs. TIME -- FOG 15, 11 AUGUST 1975

Naval Postgraduate School Equipment and Data

Gordon Schacher

A twelve foot steel tower was installed on the port bow of the ship and sensors were installed at the top of this tower and on the first level of the ship's mast. The mean heights of these two levels above the sea surface are:

bow tower	12.2 m
mast	23.9 m

The following parameters were measured at both levels:

humidity
temperature
horizontal wind speed
temperature fluctuations
horizontal wind speed fluctuation

A sea surface temperature sensor was installed at the starboard side of the ship about 50 feet forward of the stern.

In addition to this equipment Jim Russell of the Naval Avionics Facility installed wind direction sensors and microwave refractometers at both levels. This allowed us to obtain wind velocity and humidity fluctuations. These instruments are described in his report.

Details of the equipment used for the measurements are as follows:

Humidity: Hygrodynamics Digital II using a 15-1818 sensor. The sensor includes a lithium chloride cell and a thermistor so that relative humidity and temperature are simultaneously measured. This temperature sensor is used only as a monitor, not for our temperature measurements. The humidity sensors were calibrated using four standard saturated solutions. The results are given in Table 1. In Figure 1 we show calibration curves for the two sensors used.

Solution	Sensor	True Humidity	Humidity Reading	Error
NaCl	Bow	75.6	75.2	- 0.4
	Tower	75.6	75.6	0
$(NH_4)_2SO_4$	Bow	80.1	79.8	- 0.3
	Tower	80.1	80.0	- 0.1
KNO_3	Bow	91.2	90.4	- 0.8
	Tower	91.2	91.1	- 0.1
K_2SO_4	Bow	96.7	92.9	- 3.8
	Tower	96.8	93.8	- 3.0

Table 1. Humidity sensor calibrations

Temperature: Hewlett Packard Model 2801A. The sensor is a quartz crystal which is the frequency control in an oscillator circuit, the readout being a frequency counter. The accuracy of this system is 0.03°. Sea surface temperature is measured with the same system.

Both the temperature and humidity sensors are mounted in an aspirator so that they are protected from the weather, while maintaining a flow of air over them.

Wind Speed: Thornwait Model 101 Wind Register System. The cups used in this system are extremely light and can respond to wind as slight as one half knot.

Temperature Fluctuations: Homemade ac Wheatstone bridge, with TSI Model 1210 probes with platinum wire as the sensing element. The low power bridge is operated at 35 μAmp, the resistance element is approximately 40 Ohms, thus, the power dissipated in the sensor is 5×10^{-8} Watts. Very low power is used so as to insure that the sensor remains at ambient temperature. The wire is 1.2 mm in length and 2.5 μ in diameter, and has a time constant much shorter than the times encountered in atmospheric temperature fluctuations.

Wind Speed Fluctuations: TSI Model 1054B Anemometer with TSI Model 1210 probes with tungsten wire as the sensing element. The tungsten wire is 4.5 μ in diameter. The temperature and wind speed fluctuation sensors are mounted on vanes to keep them pointed into the wind. In this manner we insure that the turbulence detected is not affected by the sensor support structure. Fluctuation data is never taken unless the wind relative to the ship is from a favorable direction so that we only test air that is unaffected by the presense of the ship.

Data Recording Equipment: Fluctuation data is recorded on magnetic tape using a 14 channel tape recorder. In order to correctly understand the mean temperature and humidity data it is necessary to describe the data gathering sequence in some detail. Temperature and humidity signals go to a homemade sequencer which steps cyclically from level to level in the sequence: sea surface, bow, mast. The output of the sequencer goes to a Hewlett Packard 562AR printer. The printer obtains its print command from the sequencer and prints temperature and humidity simultaneously. When the cycle is at sea surface the humidity print out is zero and this allows us to identify the level printed. Temperature and humidity data are presented in Table 2. Note that the temperature data was recorded by the shipboard computer after 1330 on August 7th. The computer-sequencer interfacing poses some special problems. The sequencer has no command signal available to tell the computer when the sea surface level is being recorded. Thus, in order to correctly identify the level printed,the computer and sequencer must be synchronized by starting the computer record when the sea surface temperature is being presented. It is possible for the two instruments to get out of synchronization so that the temperature would be recorded for the wrong level.

Navigation Charts

Charts of the ship's position in the Nova Scotia area are shown in Figures 2 and 3. These charts were constructed by a combination of Loran C from the scientific navigation room, the ship's log, radar fixes, Loran A from the bridge, and by some seat-of-the-pants dead reckoning. It had been planned to use only the Loran C system for chart preparation, but the area below Nova Scotia is a poor area for its use and we encountered difficulties. For constructing the chart, the computer readout of the Loran C fixes was primarily used up until August 3rd. From this point on, the chart was constructed by comparing the computer readout with radar fixes and the ship's log of the times at which course changes were made, using the ship's speed. The second chart, Figure 3, which is of the Grand Banks area, was made entirely from the ship's log and the bridge charts. It is easily seen that the two charts don't quite fit together. No attempt has been made to correct this. The data used from the bridge log in constructing the charts is shown in Table 3. Note that the ship's log is on local time and all charts and data are logged with respect to Eastern Standard Time. There was a time zone change on August 7th.

Table 3. Data from the Ship's Log used in Chart Preparation

8/2/75	Positions	0800	42°56', 62°26'
		1200	43°24', 63°14'
		2000	43°59', 63°42'
	0010 Change course to 060°		
	0035 Engines slow		
	0055 Resume speed		
	0830 Change course to 299°		
	0900 Change course to 300°		
	1009 Change course to 301°		
	1300 Ship stopped		
	1545 Full ahead at 280°		
	1620 Change course to 300°		
	1705 Change course to 287°		
	1805 Change course to 060°		
	2148 Change course to 240°		
	2315 Change course to 180°		
8/3/75	Positions	0800	43°37', 63°57'
		1200	44°02', 63°30'
		2000	44°53', 61°22'
	0405 Change course to 345°		
	0901 Change course to 060°		
	1615 Change course to 064°		
	2120 Reduce speed (95 rpm)		
	2210 Change course to 194°		
	2230 Resume speed (125 rpm)		

8/4/75	Positions	0800	44°28', 62°04'
		1200	44°20', 62°14'
		2000	44°12', 62°31'

0210 Change course to 192°
0402 Change course to 310°
0840 Change course to 100°
0949 Ship stopped
1030 Full ahead
1035 Change course to 270°
1500 Change course to 180°
1550 Change course to 270°
1630 Ship stopped
1650 Resume speed
2055 Change course to 180°
2300 Ship stopped
2320 Resume speed

8/5/75	Positions	0800	43°52', 64°08'
		1200	44°11', 63°10'
		2000	44°52', 61°06'

0230 Change course to 300°
0745 Change course to 060°
0920 Change course to 055°
1017 Change course to 062°
1340 Change course to 075°
1412 Decrease speed to 8 knots
1500 Change course to 062°, resume 12 knots speed
2110 Change course to 064°

8/6/75	Positions	0800	44°46', 60°52'
		1200	44°20', 61°54'
		2000	44°28', 62°29'

0200 Change course to 180°
0300 Change course to 242°
1410 Change course to 240°
1530 Change course to 242°
1745 Change course to 060°
2115 Change course to 062°
2220 Change course to 064°

8/7/75	Positions	0800	45°06', 59°16'	Advance clocks 20 min. at 0100, 0500, and 1100 going into new time zone.
		1200	45°05', 58°06'	
		2000	45°20', 56°11'	

0200 Change course to 90°
1410 Change course to 88°
1510 Change course to 86°
1850 Change course to 0°
1900 Reduce speed (110 rpm)
1930 Reduce speed (100 rpm)
2015 Ship stopped
2032 Resume speed
2215 Change course to 270°
2245 Change course to 180°

8/8/75	Positions	0800	44°49', 56°10'
		1200	45°21', 56°11'
		2000	45°17', 56°33'

0610 Change course to 090°
0640 Change course to 0°
1345 Change course to 270°
1445 Change course to 180°
1808 Change course to 270°
1850 Change course to 0°
2200 Change course to 270°
2300 Change course to 180°

8/9/75	Positions	0800	44°58', 56°56'
		1200	45°35', 56°45'
		2000	44°54', 56°11'

0210 Change course to 182°
0310 Change course to 180°
0455 Change course to 270°
0550 Change course to 0°
1200 Change course to 090°
1545 Change course to 180°

8/10/75	Positions	0800	43°46', 56°32'
		1200	44°23', 56°36'
		2000	45°10', 57°00'

8/10/75 0450 Change course to 270°
0645 Change course to 0°
1135 Change course to 002°
1210 Change course to 002°
1410 Change course to 005°
1510 Change course to 360°
1728 Change course to 263°
1728 Change course to 265°

Sea Surface Temperature

Charts showing the recorded sea surface temperature for one half hour intervals are presented in Figures 4 and 5. From the data shown on Figure 4 we see that the temperatures recorded at the same location on different days were in quite good agreement. Note that on one leg of the pattern sailed by the ship we indicate that incorrect readings were obtained. We obtained temperatures that were much too low because of a malfunction in the equipment. In addition, there are five temperatures on the plot that are circled because they could not be included in constructing isotherms. (Isotherm charts are available from G. Schacher, NPS) The data from the Grand Banks area shows a different temporal behavior than that from just below Nova Scotia. As can be seen from Figure 5, the temperatures recorded for the same location were not the same at different times. It appears that the average sea surface temperature increased by about one degree while we were in the area.

Times When Errors Occurred in Data

There were times during the cruise when parts of the equipment were known to be either inoperative or operating incorrectly. These periods are listed for reference below.

7/29/75 The temperature values recorded may have been 0.6°C low all day due to loading of the quartz thermometer readout by the computer line. Line removed at 2000 and values correct after that time.

7/31/75 1100 Had to replace bow level wind cups

8/02/75 0900 Replace lamp in mast wind cups

8/03/75 1930 Mast wind cups giving intermittant readings

8/04/75 0100 Note that mast wind cups are out
1400 Sea surface temperature unit out
Both level wind cups still out

8/05/75 0830 Sea surface temperature repaired and working
0830 Wind cups fixed on both levels

Table 2

Temperature and humidity as a function of time. Values are given every half hour, and are available every 2.5 min. The code at the right hand side of the table shows the times at which turbulence records were taken.

Time	T_s	T_1	T_2	H_1	H_2
7/29					
1330	25.21	25.20	25.20	85.6	84.1
1400	-	-	-	86.1	84.1
1430	25.37	-	25.37	85.9	84.0
1500	-	-	-	85.3	83.9
1530	-	-	-	84.4	83.9
1600	24.50	24.54	24.54	84.6	85.9
1630	25.34	25.34	25.37	84.7	84.9
1700	25.32	25.30	25.25	85.0	85.2
1730	25.25	25.20	25.24	86.2	86.5
1800	25.04	25.05	25.04	87.9	87.9
1830	-	-	-	87.0	87.0
1900	25.44	25.47	25.44	86.9	87.3
1930	25.50	25.45	25.45	87.4	87.6
2000	25.70	25.71	25.71	89.1	89.7
2030	-	-	-	-	-
2100	25.79	25.79	25.79	88.4	89.0
2130	25.34	25.34	25.33	88.3	88.5
2200	25.30	25.31	25.30	88.1	87.8
2230	23.67	23.66	23.66	91.0	91.3
2300	23.35	23.34	23.34	91.5	91.5
2330	23.30	23.29	23.28	89.2	89.0
7/30					
0000	23.17	23.17	23.17	72.2	72.5
0030	23.29	23.25	23.28	69.8	70.0
0100	23.17	23.15	23.16	67.3	66.3
0130	23.31	23.31	23.32	61.9	61.1
0200	23.54	23.54	23.54	63.4	63.8
0230	23.98	23.97	23.99	66.0	66.3
0300	22.57	22.56	22.56	86.2	84.8
0330	23.91	23.90	23.90	74.0	73.2
0400	23.98	23.98	23.98	61.7	60.0
0430	23.89	23.87	23.87	65.7	65.8
0500	23.76	23.75	23.74	62.0	61.5

Time	T_s	T_1	T_2	H_1	H_2
0530	23.73	23.73	23.74	65.3	64.6
0600	23.80	23.80	23.81	65.8	65.7
0630	24.09	24.09	24.08	69.9	-
0700	23.73	23.72	23.72	72.0	70.6
0730	-	23.17	23.17	73.9	72.2
0800	23.23	-	23.24	74.2	72.4
0830	21.93	21.92	21.93	72.8	71.3
0900	21.84	21.84	21.84	74.7	73.5
0930	-	20.31	-	84.1	79.9
1000	19.76	20.60	-	78.2	75.9
1030	21.14	21.13	21.16	77.8	75.6
1100	21.97	21.97	21.98	78.1	75.9
1130	21.40	21.33	21.52	73.8	72.6
1200	21.38	21.37	21.37	73.8	72.6
1230	20.88	20.85	20.88	74.5	73.3
1300	20.74	20.71	20.71	76.2	74.3
1330	21.12	20.72	20.67	71.8	70.9
1400	21.23	21.17	21.33	71.1	70.3
1430	19.72	20.13	19.83	71.6	71.5
1500	22.20	22.14	21.97	64.0	65.1
1530	20.76	20.65	21.00	68.7	69.6
1600	21.04	21.11	20.98	74.4	75.2
1630	19.74	19.84	19.40	74.3	75.3
1700	18.42	18.88	18.96	78.7	76.1
1730	19.94	19.93	19.90	79.5	79.8
1800	-	-	-	-	-
1830	-	-	-	-	-
1900	15.59	15.51	15.64	88.9	88.5
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2200	16.49	16.49	16.48	90.0	90.3
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7/31					
1100	10.02	13.90	14.94	95.3	90.7

Time	T_s	T_1	T_2	H_1	H_2	
1130	9.69	13.39	-	93.8	92.7	
1200	-	-	-	-	-	
1230	-	-	-	-	-	
1300	11.17	13.00	-	93.2	92.4	
1330	11.28	13.56	14.09	93.4	92.5	
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1630	13.43	14.85	15.03	92.0	92.4	31-1
1700	13.73	14.32	14.58	92.5	93.4	
1730	14.19	14.97	15.54	93.4	91.9	
1800	14.09	-	15.83	92.2	91.0	
1830	12.78	14.76	15.28	92.5	91.9	31-2
1900	11.89	-	15.70	93.0	90.6	
1930	11.45	14.38	15.25	92.2	92.0	
2000	15.52	16.06	16.17	94.8	92.2	
2030	17.69	17.16	17.21	92.5	91.0	31-3
2100	19.96	17.52	17.42	91.5	90.4	
2130	17.25	17.90	18.00	81.1	87.8	
2200	17.34	17.24	17.31	90.8	90.4	
2230	21.00	18.36	18.08	89.5	89.0	31-4
2300	20.55	18.44	18.43	86.9	86.8	31-5
2330	20.78	18.01	17.93	88.9	88.9	31-6
8/1						
0000	20.17	18.42	18.36	86.9	86.6	
0030	19.63	18.56	18.50	86.8	86.6	1-1
0100	16.32	16.68	16.99	88.5	88.5	
0130	15.28	16.18	16.53	91.3	90.7	
0200	14.65	15.91	16.53	91.2	89.0	1-2
0230	15.54	16.18	16.51	90.1	88.0	
0300	15.36	16.20	16.50	90.0	87.3	1-3
0330	-	-	-	-	-	
0400	-	-	-	-	-	
0430	16.35	16.39	16.53	77.6	74.5	1-4
0500	15.83	16.32	16.64	75.4	70.3	
0530	14.89	16.15	16.55	74.6	72.1	1-5

Time	T_s	T_1	T_2	H_1	H_2	
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0900	9.41	12.91	14.94	77.6	72.3	1-6
0930	9.17	12.32	14.38	83.9	75.8	
1000	9.32	12.90	15.33	82.9	76.4	
1030	9.15	12.70	15.08	84.1	79.5	
1100	8.47	13.75	15.23	81.1	76.2	
1130	10.21	13.62	14.95	83.8	77.9	
1200	11.06	13.46	14.42	84.0	79.0	1-7
1230	11.74	13.35	13.98	85.6	80.5	
1300	12.12	13.60	14.22	84.9	79.2	
1330	11.70	13.80	14.45	84.1	79.5	
1400	12.66	-	14.04	83.6	79.9	1-8
1430	12.51	13.74	13.75	85.3	82.6	
1500	10.97	13.47	13.58	86.6	85.9	
1530	11.58	13.67	13.70	86.2	65.3	
1600	11.30	13.03	13.38	86.1	83.9	
1630	10.75	12.87	14.25	85.9	79.7	1-9
1700	9.30	12.96	14.66	88.0	81.2	
1730	9.85	13.63	14.50	90.5	85.2	
1800	13.61	13.14	14.33	89.1	85.6	
1830	13.55	14.08	14.40	87.6	85.0	
1900	-	14.07	14.30	87.3	84.9	1-10
2000	12.85	13.42	13.53	89.6	88.1	1-11
2030	12.66	12.49	12.59	89.7	87.7	
2100	13.18	13.49	13.65	88.8	86.4	
2130	13.26	13.69	13.76	90.3	89.1	
2200	12.93	14.16	14.18	88.0	85.6	
2230	15.10	14.59	14.55	87.3	86.4	
2300	17.40	15.50	15.35	83.2	81.9	
2330	17.44	15.28	15.26	85.9	85.2	
8/2						
0000	16.24	15.52	15.52	85.3	83.7	
0030	12.98	15.68	15.81	85.8	85.2	

Time	T_s	T_1	T_2	H_1	H_2	
0100	14.80	16.04	16.02	86.2	85.0	
0130	13.78	16.26	16.21	83.8	82.6	
0200	13.11	16.08	16.06	83.5	82.9	
0230	9.25	14.77	14.81	87.7	86.6	
0300	10.08	14.71	14.66	83.8	82.1	
0330	10.91	14.27	14.21	86.4	84.5	
0400	9.42	14.92	14.84	82.1	81.4	
0430	6.08	15.59	15.60	84.9	84.2	
0500	9.15	16.15	15.88	87.3	86.3	
0530	8.02	16.57	16.49	82.1	81.4	
0600	7.75	16.66	16.58	81.6	80.7	
0630	7.24	16.36	16.40	83.9	83.6	
0700	8.73	15.74	15.76	88.2	88.2	
0730	9.33	15.86	15.80	88.2	88.4	
0800	10.28	16.14	16.09	86.3	86.2	
0830	10.02	16.24	16.35	84.2	83.7	
0900	10.80	16.17	16.40	83.9	83.2	
0930	17.01	16.02	16.22	85.8	85.3	
1000	16.75	15.90	16.22	83.3	82.3	2-1
1030	15.65	15.97	15.88	84.2	82.0	
1100	15.76	15.83	15.84	86.7	84.9	
1130	15.30	15.67	15.69	87.7	85.9	
1200	13.33	15.57	15.95	87.6	84.3	
1230	11.95	13.78	14.36	87.7	83.8	
1300	12.09	13.45	14.09	87.0	83.1	
1330	10.48	13.82	14.52	88.6	86.7	2-2
1400	10.83	13.97	15.17	88.2	86.8	
1430	10.93	14.63	15.37	84.5	86.1	
1500	10.44	13.70	15.60	88.5	88.1	
1530	10.39	13.50	15.53	90.0	90.9	
1600	10.60	13.60	14.50	90.8	87.2	
1630	11.42	13.53	14.48	91.9	89.7	
1700	12.11	14.26	15.22	91.2	88.1	
1730	11.80	14.62	16.08	91.7	87.4	

Time	T_s	T_1	T_2	H_1	H_2	
1800	11.42	13.71	15.39	92.1	88.2	2-3
1830	-	-	-	-	-	
1900	10.64	13.28	13.87	93.1	92.2	
1930	10.86	12.62	13.44	94.0	93.9	2-4
2000	10.72	12.55	13.20	95.6	95.2	
2030	10.89	14.09	14.75	96.8	97.1	
2100	10.67	13.97	14.37	96.8	96.9	2-11
2130	14.12	14.20	14.39	96.6	96.4	
2200	14.38	14.26	14.33	96.3	96.3	
2230	11.12	13.78	14.55	95.7	96.2	2-15
2300	9.96	13.09	14.09	96.2	95.4	
2330	10.31	12.49	14.45	96.6	95.6	2-21
8/3						
0000	9.73	13.10	14.69	97.1	95.1	3-1
0030	10.37	13.65	15.02	97.1	94.9	
0100	11.18	13.64	15.06	97.0	93.0	
0130	10.47	13.41	14.69	96.9	93.7	3-2
0200	10.52	13.43	14.88	96.9	93.2	3-3
0230	12.20	13.59	14.48	97.1	95.8	3-4
0300	10.76	13.54	15.03	96.8	96.4	3-5
0330	13.36	14.39	14.80	96.3	93.5	
0400	12.73	14.24	14.64	95.0	93.7	
0430	14.09	14.41	14.86	94.1	91.0	
0500	12.54	14.03	14.62	93.8	91.9	
0530	12.26	13.63	13.58	95.1	94.0	
0600	11.67	13.40	14.23	95.1	91.9	
0630	13.72	14.38	15.28	94.1	90.4	
0700	14.54	14.45	14.85	92.7	89.9	
0730	11.15	13.59	14.12	90.8	88.9	
0800	9.56	13.26	14.56	90.9	87.8	3-6
0830	10.41	12.80	13.37	92.5	92.6	
0900	10.13	11.56	11.70	92.4	92.1	
0930	10.56	11.58	11.90	95.2	93.9	
1000	11.20	12.49	13.34	96.0	94.2	
1030	10.82	13.10	14.09	95.0	92.1	
1100	11.99	13.31	14.01	95.4	92.7	

Time	T_s	T_1	T_2	H_1	H_2	
1130	13.59	13.78	14.03	96.2	95.1	3-8
1200	13.35	14.04	14.45	96.1	93.9	3-9
1230	13.44	13.90	14.18	95.2	94.2	3-10
1300	13.83	14.12	14.53	94.6	93.0	
1330	12.25	14.12	14.53	94.6	93.0	
1400	14.31	14.42	14.85	93.5	91.4	3-11
1430	14.35	14.54	14.98	92.0	89.8	3-12
1500	14.08	14.31	14.72	91.5	90.5	
1530	11.82	13.53	13.96	93.1	92.8	3-13
1600	12.84	13.50	13.80	95.2	94.7	
1630	13.30	13.53	13.72	96.0	95.3	
1700	11.40	12.96	13.50	95.9	94.4	3-19
1730	11.23	13.41	13.85	96.4	95.0	3-20
1800	11.74	13.60	13.91	96.8	95.0	3-21
1830	11.92	13.64	13.93	96.9	95.1	
1900	12.11	13.74	13.97	96.7	95.7	
1930	12.74	13.76	13.95	96.8	95.8	3-22
2000	11.20	14.03	14.33	96.5	95.7	3-23
2030	12.96	14.43	14.67	96.9	95.7	3-24
2100	13.67	14.65	14.86	96.9	94.9	3-25
2130	12.50	14.76	14.96	96.4	94.4	
2200	14.04	14.88	15.09	96.6	94.1	3-26
2230	14.73	15.03	15.06	96.1	95.6	3-27
2300	16.14	15.26	15.22	96.2	96.0	3-28
2330	15.91	15.42	15.39	96.0	96.2	
8/4						
0000	16.06	15.43	15.43	95.9	95.7	3-29
0030	15.29	15.54	15.51	95.7	95.8	
0100	16.19	15.68	15.65	96.1	96.1	4-1
0130	16.76	15.78	15.80	96.2	95.8	4-2
0200	16.88	15.95	15.90	96.1	96.3	
0230	16.68	16.07	16.02	95.9	95.8	4-3
0300	16.60	16.10	16.04	95.5	95.8	
0330	15.88	15.98	15.93	95.3	95.7	
0400	14.96	15.78	15.88	95.0	95.4	

Time	T_s	T_1	T_2	H_1	H_2	
0430	14.91	15.55	15.61	95.2	95.4	
0500	15.31	15.21	15.41	95.1	95.7	
0530	14.12	14.99	15.15	95.6	95.8	
0600	15.73	15.59	15.61	96.0	96.0	4-4
0630	14.05	15.42	15.51	96.0	96.0	
0700	11.47	13.25	14.15	94.7	93.9	4-5
0730	10.71	12.24	13.17	95.4	94.2	4-7
0800	10.90	12.63	13.22	96.4	95.3	4-8
0830	12.36	12.93	13.45	96.8	94.2	
0900	12.61	12.95	13.25	96.8	94.0	4-13
0930	10.20	12.69	13.30	97.0	93.9	
1000	9.33	12.78	13.55	97.0	93.0	4-14
1030	9.77	13.22	13.16	96.0	95.8	
1100	11.52	12.86	13.37	96.2	95.3	
1130	12.23	13.36	13.68	96.4	94.6	4-15
1200	12.26	13.80	13.93	96.2	94.6	
1230	12.22	13.37	13.70	96.4	93.2	
1300	12.35	13.00	13.36	96.4	92.8	4-16
1330	10.31	12.47	13.05	96.7	92.3	
1400	10.67	12.43	13.00	97.6	92.7	4-17
1430	-	13.37	13.71	97.4	94.2	4-18
1500	-	15.12	15.20	97.2	94.9	
1530	-	15.31	15.31	96.4	95.1	
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8/5						
0830	10.45	13.13	14.11	96.7	92.2	
0900	11.25	13.01	13.01	96.5	93.2	
0930	10.00	13.00	14.70	95.8	89.8	
1000	10.50	13.02	13.03	96.3	89.9	5-1
1030	10.54	14.51	14.41	96.8	89.9	5-2
1100	13.01	14.44	15.47	95.4	87.7	
1130	13.45	15.21	15.51	94.0	88.1	5-3
1200	14.00	15.43	15.40	93.1	89.9	5-4
1230	13.42	15.41	15.45	91.6	91.1	
1300	14.20	15.41	15.44	91.7	91.8	

Time	T_s	T_1	T_2	H_1	H_2	
1330	14.55	14.13	14.25	90.2	90.5	
1400	12.50	-	-	-	-	
1430	11.20	-	-	-	-	
1500	11.45	15.55	14.01	85.2	82.8	
1530	11.47	14.75	15.44	88.7	88.9	
1600	12.42	15.24	15.57	90.9	90.2	5-6
1630	12.54	15.55	15.52	86.8	87.1	
1700	11.45	15.50	-	88.3	87.3	5-7
1730	12.57	15.17	15.05	87.5	88.4	5-8
1800	13.03	14.44	15.04	89.5	90.2	
1830	10.32	15.04	15.05	90.0	90.2	5-9
1900	16.30	16.17	16.12	89.0	89.3	
1930	16.02	16.20	16.20	89.8	89.9	
2000	15.67	16.29	16.26	89.9	90.6	5-10
2030	16.87	16.62	16.56	90.5	91.3	
2100	16.49	16.86	16.89	89.7	90.3	5-11
2130	16.19	16.83	16.83	90.1	90.8	
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8/6						
0030	15.98	15.88	15.96	95.2	94.9	6-1
0100	16.06	15.85	15.98	95.4	94.9	
0130	16.00	16.00	16.07	96.0	95.3	6-4
0200	15.97	15.92	16.01	95.9	95.2	6-5
0230	15.63	15.64	15.81	96.2	96.8	
0300	15.46	15.45	15.69	96.5	97.4	6-9
0330	15.94	15.88	15.87	96.3	97.0	6-10
0400	15.80	15.89	15.94	96.3	96.7	
0430	15.90	15.60	15.72	96.5	96.4	6-11
0500	15.37	15.63	15.77	96.4	96.4	
0530	15.38	15.52	15.65	96.6	96.6	6-12
0600	14.77	15.60	15.70	96.6	96.9	
0630	14.68	14.69	15.57	96.7	96.6	6-13
0700	14.64	15.73	15.94	96.6	96.9	6-14
0730	16.00	16.16	16.28	96.6	96.9	6-15
0800	16.36	16.56	16.57	96.4	96.5	

Time	T_s	T_1	T_2	H_1	H_2	
0830	16.71	16.83	16.85	96.2	95.7	6-16
0900	16.48	16.74	16.83	94.7	96.1	6-18
0930	16.76	16.75	16.86	95.0	95.4	
1000	17.08	17.09	17.13	95.2	94.9	6-19
1030	16.20	16.92	16.83	93.5	92.6	6-22
1100	16.60	16.97	16.94	90.8	90.9	
1130	16.07	15.51	15.88	89.0	89.9	
1200	14.07	14.79	15.27	89.2	90.6	6-23
1230	16.76	16.60	16.83	90.6	90.7	
1300	16.29	17.33	17.63	87.4	87.6	
1330	16.26	17.01	17.19	88.0	88.1	
1400	17.00	17.47	17.73	88.6	87.4	
1430	16.70	17.22	17.92	87.9	96.9	
1500	17.45	17.39	17.80	87.0	85.6	
1530	16.89	18.81	19.41	85.1	82.9	
1600	17.33	17.91	18.51	86.4	85.1	
1630	16.02	17.24	17.55	88.7	87.9	6-24
1700	15.26	17.53	17.44	89.5	89.4	
1730	15.72	17.05	17.03	90.0	90.3	6-25
1800	15.73	16.79	16.98	90.7	92.0	
1830	14.79	16.37	16.40	90.7	92.2	
1900	15.19	16.50	16.69	92.2	93.1	6-26
1930	14.62	15.85	16.41	92.9	94.1	6-28
2000	15.51	15.84	15.95	93.6	94.6	
2030	14.69	15.59	15.70	93.1	94.1	6-29
2100	14.12	15.27	15.41	93.5	94.5	
2130	14.93	15.33	15.36	92.2	94.1	
2200	15.90	15.67	15.64	93.9	94.8	6-30
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8/7						
0100	16.80	16.84	16.83	93.9	95.1	
0130	17.12	17.13	17.18	91.5	92.2	
0200	17.24	17.08	17.07	90.8	91.3	

Time	T_s	T_1	T_2	H_1	H_2	
0230	16.90	17.47	17.43	92.7	94.0	
0300	17.06	17.20	17.13	94.4	95.8	
0330	15.55	16.90	16.89	95.3	96.3	7-1
0400	15.65	16.32	16.47	95.7	96.9	7-2
0430	16.06	16.16	16.15	96.1	97.1	7-3
0500	16.24	16.11	16.08	96.2	97.1	7-4
0530	16.49	15.81	15.79	96.4	97.2	7-5
0600	16.47	15.93	15.91	96.5	97.3	
0630	16.55	16.16	16.15	96.5	97.4	
0700	16.26	16.34	16.35	96.6	97.3	7-10
0730	16.22	16.49	16.57	96.6	96.4	7-11
0800	16.32	16.52	16.73	96.5	96.4	7-12
0830	16.40	16.56	16.55	96.9	95.9	7-13
0900	16.62	16.67	16.76	95.8	94.8	
0930	16.55	16.82	16.79	95.1	94.9	7-14
1000	16.39	16.47	16.33	94.3	94.1	7-15
1030	16.20	16.44	16.21	94.1	96.3	
1100	15.66	16.24	16.01	94.1	95.6	7-16
1130	16.06	16.44	16.25	94.1	94.7	
1200	-	-	-	-	-	
1230	15.85	16.23	16.04	92.9	94.8	
1300	16.25	16.29	16.07	93.7	95.1	7-17
1330	16.24	16.33	16.34	92.7	94.5	
1430	-	16.16	16.02	93.2	95.0	
1500	-	16.08	15.92	93.8	95.7	
1530	16.16	16.08	16.08	93.4	95.7	
1600	16.24	15.92	15.76	93.9	96.3	7-18
1630	16.16	-	15.80	94.2	96.7	
1700	15.90	15.76	15.66	94.8	97.2	
1730	15.76	15.76	15.52	95.3	97.6	7-19
1800	15.32	15.18	15.64	96.4	98.0	7-22
1830	14.96	14.90	14.24	96.8	98.4	7-23
1900	14.78	14.76	14.52	97.1	98.3	
1930	14.86	14.84	14.98	97.4	98.0	
2000	14.90	14.90	-	97.4	98.0	

Time	T_s	T_1	T_2	H_1	H_2	
2030	15.06	15.06	15.06	97.4	98.2	7-28
2100	-	15.22	15.12	97.4	98.0	
2130	15.30	15.28	-	97.4	98.0	
2200	15.36	15.32	15.32	97.3	98.0	7-29
2230	15.34	15.34	15.22	97.3	98.0	7-31
2300	15.30	15.26	-	97.3	97.9	7-32
2330	15.28	-	15.14	96.8	97.7	
8/8						
0000	15.24	15.22	-			7-36
0030	14.96	15.04	14.48			
0100	14.40	14.74	15.08			
0130	14.46	15.32	15.34			
0200	-	15.28	15.34			8-6
0230	14.84	15.44	15.50			8-7
0300	-	15.62	15.60			8-8
0330	16.28	16.28	15.80			
0400	-	16.00	15.96			8-9
0430	16.40	16.42	15.96			8-10
0500	16.30	15.98	15.96	97.8	98.5	
0530	16.08	15.96	15.94	98.1	98.7	
0600	16.10	16.04	16.06	98.2	98.8	8-15
0630	16.68	16.02	16.06	98.3	98.9	8-16
0700	16.10	15.80	15.88	98.3	99.0	8-17
0730	16.06	16.04	15.50	98.3	98.8	8-18
0800	16.08	15.50	15.55	98.2	98.7	8-20
0830	-	14.98	15.30	98.0	98.0	
0900	14.08	14.76	6.76	98.0	97.5	8-24
0930	-	14.70	15.16	98.0	96.0	8-25
1000	14.78	14.32	14.32	97.7	95.2	8-26
1030	-	14.30	14.52	97.3	95.7	
1100	14.92	14.40	14.62	96.8	95.6	8-28
1130	15.02	14.28	14.50	96.4	95.8	
1200	-	14.44	14.60	95.1	93.7	
1230	15.14	14.58	14.78	90.0	89.0	8-29
1300	14.96	15.26	14.90	82.8	80.7	

Time	T_s	T_1	T_2	H_1	H_2	
1330	15.02	15.38	15.16	82.6	80.5	
1400	-	14.90	14.60	83.9	82.3	8-30
1430	15.04	14.84	14.84	86.7	84.4	
1500	14.72	14.82	14.62	87.7	86.9	8-31
1530	14.62	14.26	14.10	92.8	93.8	8-32
1600	15.28	14.48	14.34	93.5	94.0	8-34
1630	-	14.60	14.56	92.5	92.7	
1700	15.12	14.70	14.60	91.8	92.3	8-35
1730	15.68	14.60	14.48	92.7	94.5	
1800	15.48	14.56	14.60	93.8	95.2	
1830	15.40	14.44	14.46	93.8	95.3	
1900	15.48	14.16	14.16	96.0	97.1	8-36
1930	15.28	14.12	14.08	96.7	97.9	8-38
2000	15.04	15.04	14.08	97.4	98.2	8-40
2030	14.82	13.82	13.74	97.3	97.9	8-41
2100	15.08	14.02	13.88	96.5	97.5	
2130	15.10	14.18	14.06	92.4	94.0	
2200	14.78	14.08	14.08	92.4	94.3	8-42
2230	15.20	13.52	13.48	94.6	96.0	
2300	15.24	13.68	13.64	96.7	97.5	8-48
2330	15.30	14.14	14.10	97.2	98.0	
8/9						
0000	15.28	15.28	14.48	97.1	98.2	8-49
0030	-	14.70	14.64	97.3	98.1	
0100	15.22	14.80	14.74	97.4	98.2	9-5
0130	-	15.08	15.02	97.2	97.8	9-6
0200	15.94	15.34	15.28	97.1	98.1	9-7
0230	16.00	15.54	15.50	97.2	98.2	
0300	16.14	15.74	15.68	96.9	97.8	9-11
0330	15.90	15.88	15.84	97.3	97.8	9-12
0400	16.16	16.00	15.96	96.9	97.6	9-13
0430	-	15.70	15.68	97.2	97.7	9-14
0500	15.92	15.64	15.62	97.0	97.6	9-15
0530	15.84	15.84	15.28	96.9	97.8	9-16
0600	16.08	14.92	14.90	96.8	97.5	9-17

Time	T_s	T_1	T_2	H_1	H_2	
0630	-	14.86	14.82	96.8	97.4	
0700	15.74	14.98	14.74	96.6	96.9	9-18
0730	15.32	14.76	14.68	96.3	96.8	
0800	15.60	15.60	14.54	96.3	97.0	9-19
0830	15.92	14.70	14.70	96.1	96.5	9-20
0900	-	14.78	14.68	95.4	95.6	
0930	-	14.72	14.68	95.2	95.9	9-21
1000	16.46	14.86	14.84	94.7	95.0	9-22
1030	16.44	15.24	7.26	92.0	92.7	
1100	15.80	15.16	14.96	90.4	91.0	9-23
1130	15.90	15.62	15.60	88.7	88.0	
1200	15.28	16.08	15.82	87.4	87.6	9-24
1230	15.88	15.90	15.82	88.1	88.7	
1300	15.24	15.46	15.26	90.8	92.6	9-25
1330	15.88	15.26	15.16	92.4	94.5	9-26
1400	16.08	15.44	15.46	91.3	92.7	
1430	16.30	16.28	15.50	90.8	91.3	
1500	16.46	15.58	15.60	90.4	91.0	9-27
1530	15.64	15.66	-	90.2	91.0	
1600	15.68	15.72	15.50	91.2	91.4	
1630	15.74	16.04	15.74	90.9	89.2	
1700	15.48	15.64	-	91.8	91.9	9-28
1730	14.78	14.86	15.46	94.6	96.2	9-31
1800	14.96	15.04	-	96.0	97.0	
1830	15.18	15.18	15.92	96.3	97.2	9-35
1900	15.46	11.92	16.48	96.2	97.0	9-36
1930	15.72	-	16.76	96.2	96.9	
2000	16.06	16.00	16.74	94.9	95.5	
2030	16.32	16.26	-	94.0	95.0	
2100	16.30	16.26	17.28	94.1	95.4	9-37
2130	16.78	16.64	17.12	87.2	86.2	
2200	17.02	16.94	17.56	85.7	85.2	9-38
2230	16.90	-	16.90	85.4	84.5	
2300	16.74	16.72	17.36	89.7	90.0	
2330	16.78	16.70	-	91.4	92.8	

Time	T_s	T_1	T_2	H_1	H_2	
8/10						
0000	17.02	16.94	17.48	91.6	93.2	
0030	17.06	17.02	17.64	91.8	93.7	
0100	-	17.20	18.12	91.4	93.3	
0130	17.82	17.74	18.62	92.3	94.2	
0200	18.24	18.06	18.22	87.2	87.7	
0230	18.10	18.00	18.94	86.2	87.0	
0300	18.06	17.96	18.76	86.6	87.1	
0330	18.20	18.12	-	89.1	89.9	
0400	18.26	18.18	18.22	88.0	89.2	
0430	18.18	18.08	16.92	89.0	90.2	
0500	18.38	18.28	-	87.9	89.1	
0530	18.40	18.32	19.26	87.8	89.0	
0600	19.00	18.52	18.98	87.1	87.6	
0630	18.28	18.28	18.76	87.4	87.8	
0700	17.84	17.96	18.94	88.1	88.6	10-1
0730	17.24	17.54	18.98	89.5	90.4	
0800	17.34	17.70	19.14	91.4	91.3	
0830	17.65	18.00	19.04	89.0	88.5	
.						
.						
.						
1100	17.40	17.36	14.10	85.7	85.1	
1130	17.32	17.00	17.18	84.8	84.4	
1200	-	16.82	16.74	88.4	89.4	
1230	17.06	16.76	16.52	88.6	90.7	
1300	17.22	16.66	16.38	89.0	91.7	
1330	17.08	16.38	16.18	89.2	91.8	10-2
1400	17.02	16.94	-	89.2	91.6	
1430	17.06	16.26	15.88	89.6	92.2	10-6
1500	-	16.68	15.96	93.2	91.2	
1530	16.08	16.94	17.24	87.7	90.6	
1600	16.24	16.26	17.76	84.7	88.5	
1630	16.70	15.32	17.12	85.9	89.7	
1700	15.32	16.24	15.40	91.5	91.7	10-7
1730	15.52	-	15.58	95.3	96.1	

Time	T_s	T_1	T_2	H_1	H_2	
1800	15.54	12.52	15.60	95.8	96.7	10-13
1830	-	16.24	16.20	95.8	96.5	
1900	16.16	16.80	16.78	93.8	94.5	10-16
1930	16.78	16.84	16.84	93.3	94.5	
2000	16.96	16.98	16.90	93.8	95.2	10-17
2030	16.74	16.74	17.18	93.5	95.0	
2100	16.92	17.46	17.42	93.8	95.3	10-18
2130	16.96	17.54	17.50	93.4	94.9	
2200	16.76	16.76	17.44	94.1	95.7	10-19
2230	-	17.26	17.24	94.9	96.1	10-20
2300	16.42	17.10	17.10	95.6	97.1	10-23
2330	16.94	17.02	17.02	96.0	96.9	10-24
8/11						
0000	16.72	16.72	16.70	96.3	97.2	11-1
0030	16.70	16.74	16.72	96.5	97.1	11-2
0100	16.70	16.78	16.90	96.4	97.5	
0130	16.80	16.88	16.86	96.5	97.3	11-7
0200	17.06	16.96	16.96	96.8	97.8	11-8
0230	-	16.96	16.94	96.9	97.8	11-9
0300	16.98	17.00	17.06	96.9	97.7	
0330	17.16	17.16	17.28			11-15
0400	17.18	17.46	17.56			11-16
0430	17.10	17.28	17.62			
0500	-	17.18	17.46			
0530	17.00	17.32	17.60			
0600	-	17.32	17.58			
0630	17.08	17.26	17.70			
0700	17.10	17.58	17.74			

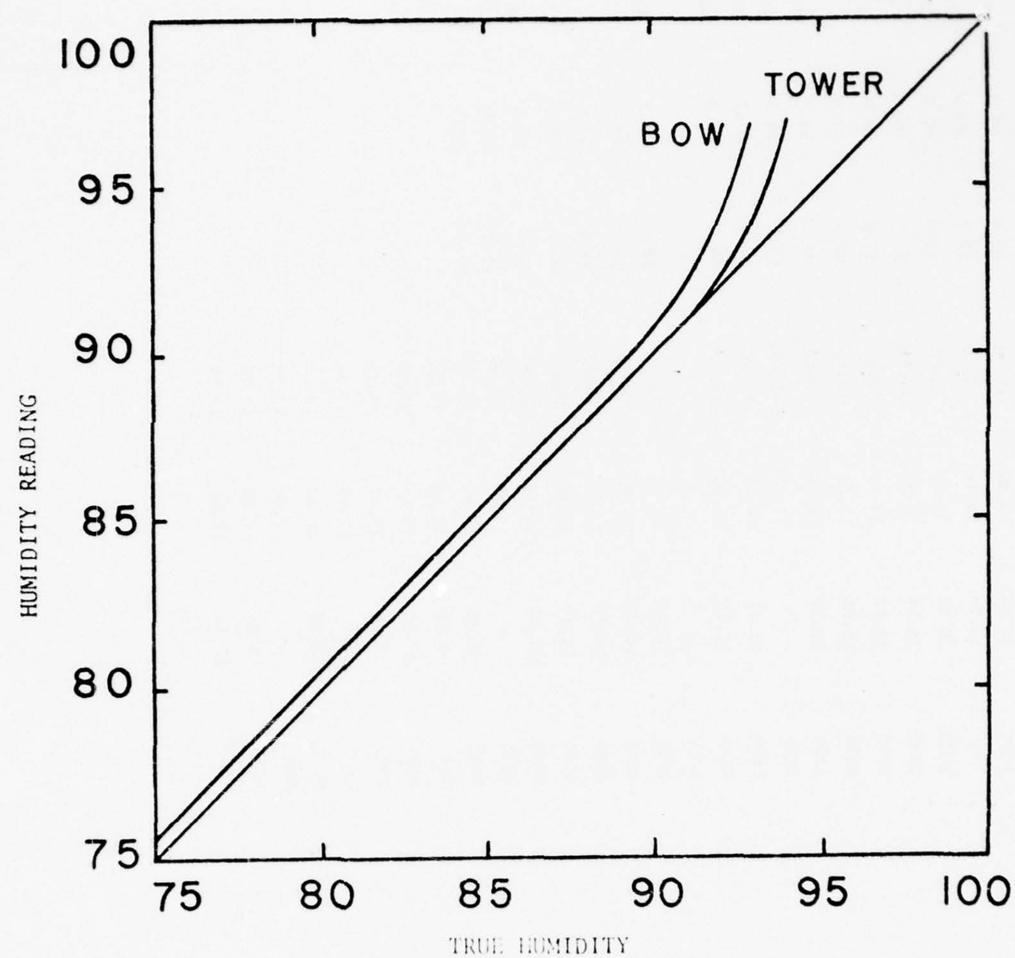


FIGURE I HUMIDITY CALIBRATION

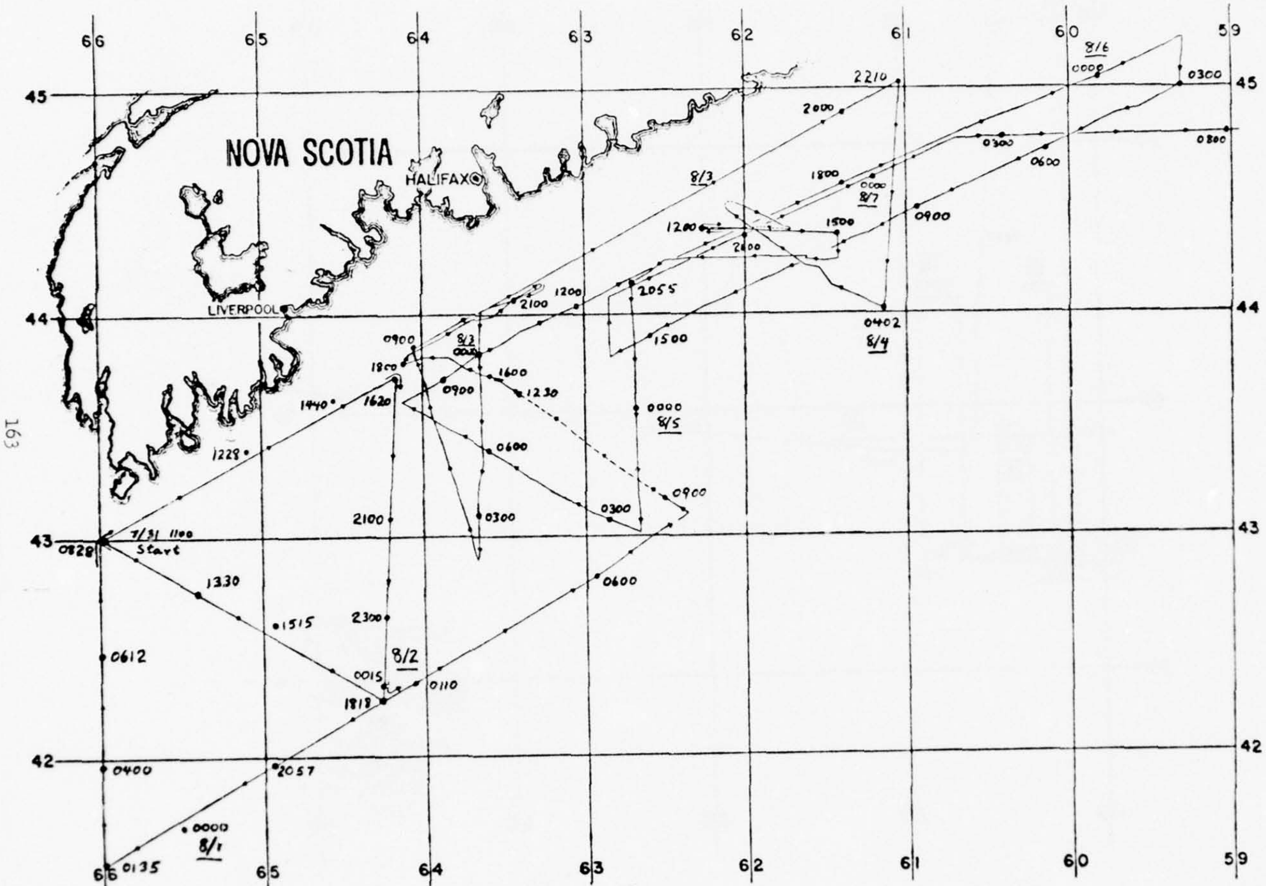


Fig 2 Ships Position
7/31 - 8/7/75

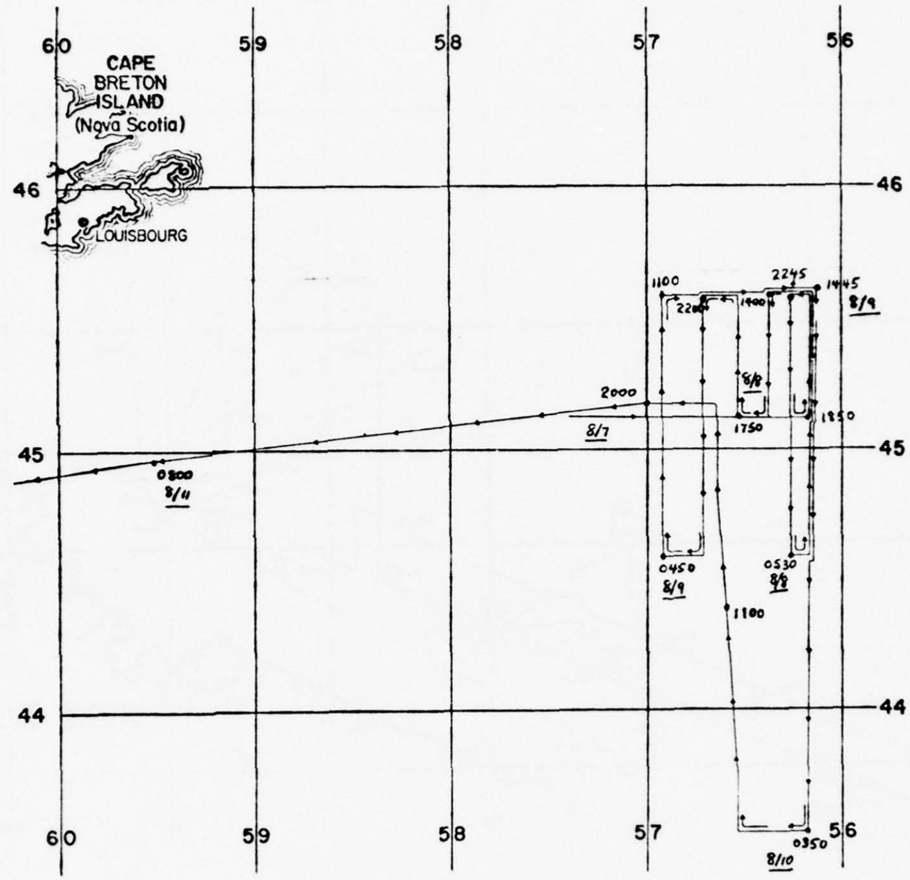
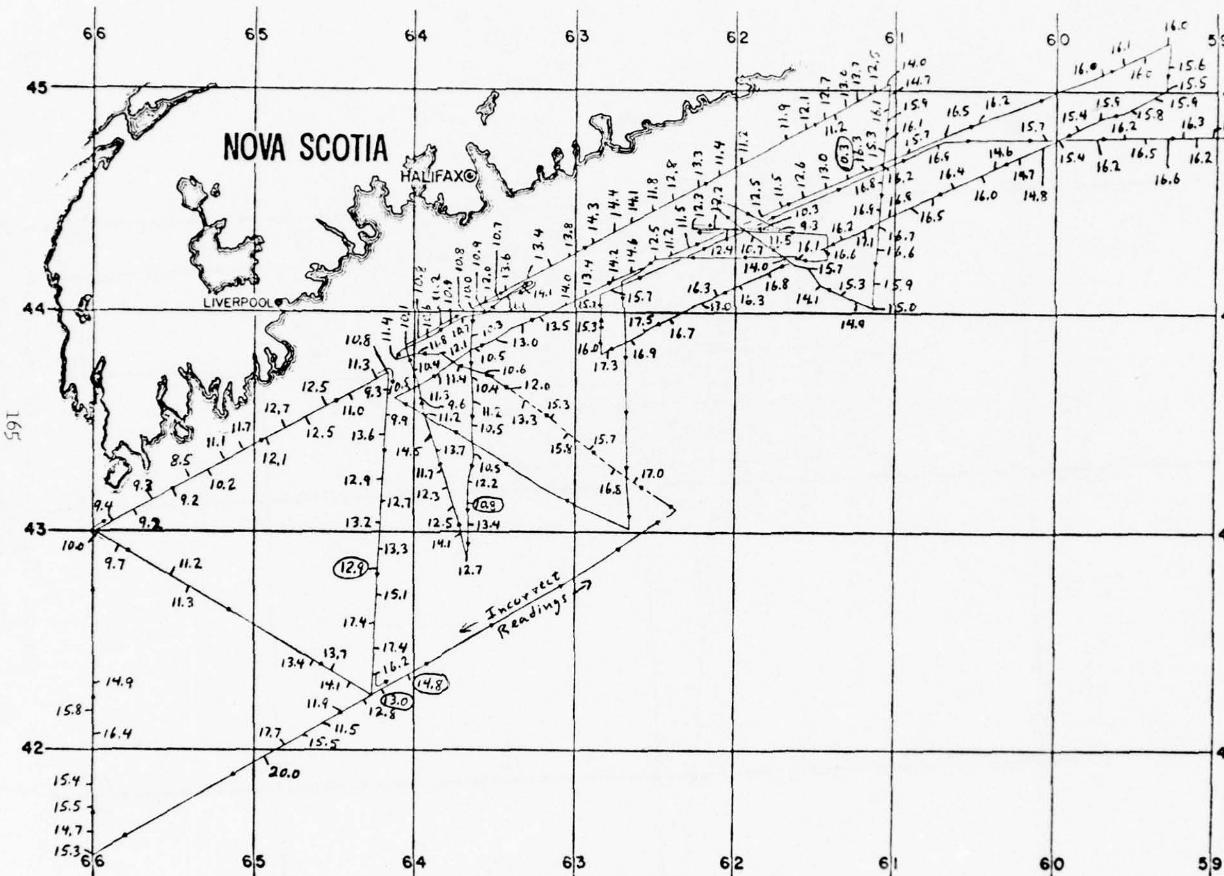
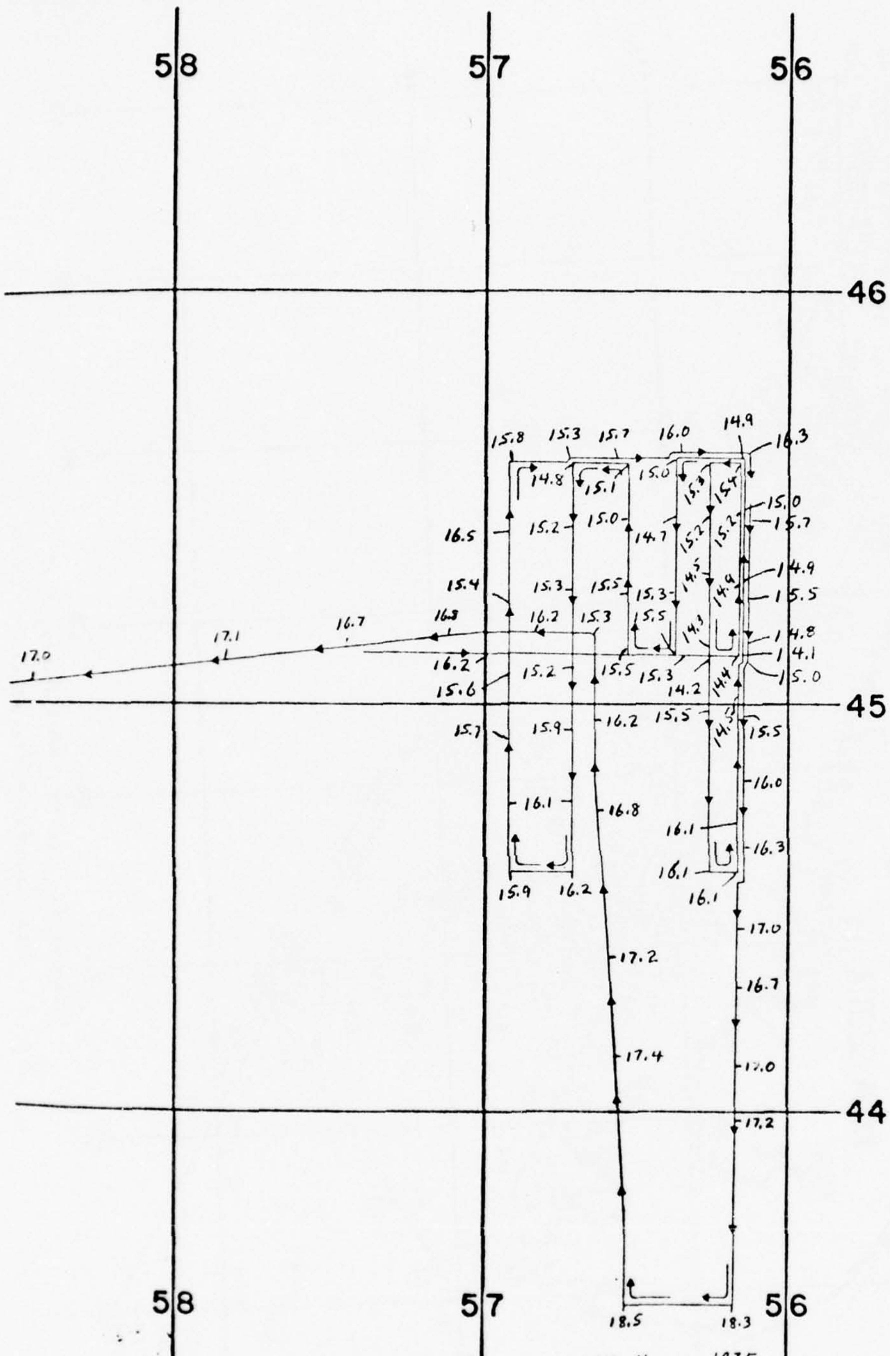


Fig. 3 Ships Position
8/7 - 8/11/75



Marine Fog Cruise, USNS Hayes, 1975

Fig. 4 Sea Surface Temperature Data



Marine Fog Cruise, USNS Hayes, 1975
Fig. 5 Sea Surface Temperature Data

CATALOG OF TEMPERATURE AND DEW POINT

SOUNDINGS OBTAINED OFF NOVA SCOTIA

DURING NAVY FOG INVESTIGATION, AUGUST 1975

Ralph Markson

Airborne Research Associates

LIST OF 41 SOUNDINGS

Aug. 1 — 5 soundings, no fog
- a) 1 departing Halifax
- b) 4 in vacinity of Hayes, 100 mi SW of Halifax

Calibration between Bellance and Navy aircraft flying in formation during a sounding, calibration between Bellanca and Hayes during low fly-by.

Aug. 2 — 8 soundings, no fog
- a) some about 60 mi SW of Yarmouth
- b) some about 40 mi SW of Halifax
- c) 1 at entrance to Halifax harbor

Aug. 5 — 8 soundings, over and to sides of fog
- a) paralleling fog bank in clear out to 100 mi E of Halifax
- b) various locations near fog between Halifax and 40 mi W of Sable Island

Aug. 10 — 15 soundings, to sides and through fog
- a) several through first fog 45 mi SE of Halifax
- b) several through second fog 40 mi SW of Halifax
- c) constant altitude (300 ft) temperature measurement from within first fog SE of Halifax through clear area to within second fog SW of Halifax

Aug. 11 — 5 soundings, through and beside fog, through heavy haze
- a) departing Halifax harbor (haze over fog)
- b) 100 mi SE of Halifax (haze)
- c) 40 mi E of Halifax (fog)

NOTES

1. All times are "local", i.e., Atlantic Daylight Saving Time = GMT - 3 hrs.
2. Temperature measured with Rosemont probe (resistance thermometer). Estimate temp accurate to $\pm$0.2 C, however apply -0.4 C correction on Aug. 1, 2, 5 and 10 (not Aug. 11).
3. Dew point measured with Panametrics probe (aluminum oxide element in Rosemont housing). Estimate precision to $\pm$0.2 C, but magnitude may be off by $\pm$1 C. Note: dew point profiles were adjusted upward by 2 to 4 C (constant for a day's data) so dew point would match temp when in cloud or fog.

4. Many of the soundings extend above the upper inversion (6000 to 10000 ft) but were not plotted for clarity in examining the structure close to the fog. These data are available. (i.e., only the lower 3600 ft of the soundings were plotted).

SUMMARY

1. There generally was an inversion over the ocean in the:
   a) 1000 to 3000 ft height range associated with no fog
   b) 0 to 700 ft height range associated with fog
   Note: The term "inversion" in this report means the level where temperature starts to increase.

2. There were no cases of fog without an inversion; there were cases of an inversion without fog. In the cases studied, the inversion was a necessary but not sufficient condition for fog, e.g., on days with fog the temperature profiles in clear areas within a few tens of miles of the fog resembled the profiles within the fog.

3. The inversion was typically 100 to 200 ft below the top of the fog (as little as 50 ft to as much as 700 ft with the inversion at the surface).

4. Large lapse rates were observed at the low inversion, they appeared greatest within the fog, typical values were 1 1/2 C to 3 C temperature increases over a 50 ft height increment at the inversion near the top of the fog.
   Note: "Lapse rate" as used here means increase in temperature with height.

5. Large lapse rates were observed in one case at both the top and base of a stratus cloud deck on top of fog extending to the surface.

6. The temperature structure was frequently isothermal below the inversion at the top of a fog down to the surface.

7. Bands of fog about 15 to 20 miles wide appeared to form frequently along the coastline extending from the land out to sea.

8. An example of fog formation in one of the manners discussed in the March 1975 Calspan Report (Mack et al.) was observed. This was a case of almost saturated air advected across relatively cool water to a region of warmer water. On 10 Aug with SW wind flow across a clear area, a fog formed east of the 63rd parallel almost exactly along the strong N-S temperature gradient charted by personnel on the Hayes (see map).

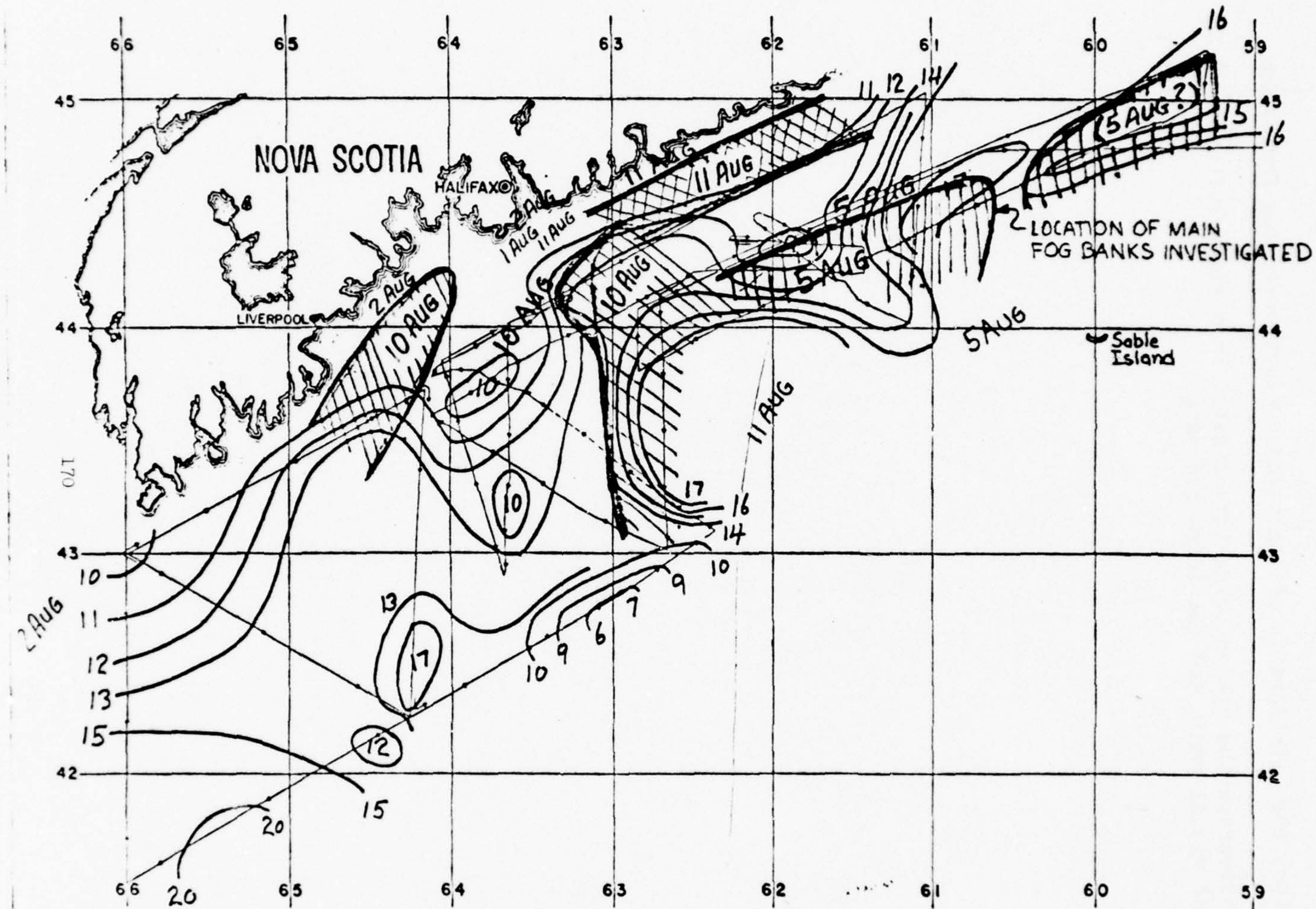
9. Band structure, discussed in the Calspan report, was a common feature of most of the fogs observed. The spacing of bands varied but was on the order of a few hundred meters. The bands were oriented both parallel to the wind as well as crosswind. Inasmuch as most of the fogs had structure and were not homogeneous layers of stratus, it is suggested that organized air motions beneath the inversion play an important role in fog formation.

RECOMMENDATIONS FOR FUTURE FOG INVESTIGATIONS

1. Study the relationship of organized convection to fog formation.

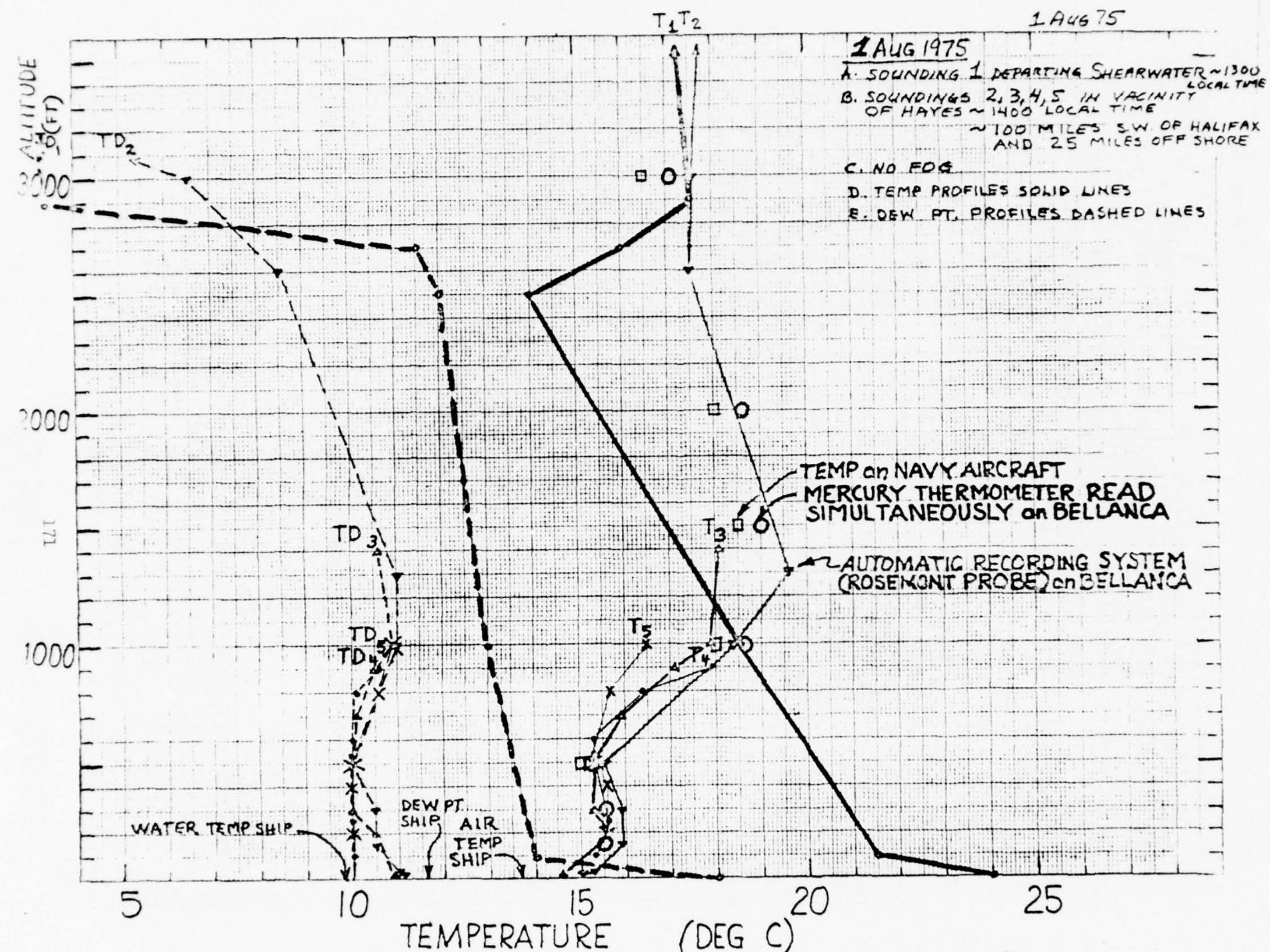
2. Photograph the region being investigated from high altitude both in the visual range and the infra-red range.

DATES AND LOCATIONS OF TEMP/DEW PT SOUNDINGS BY MARKSON

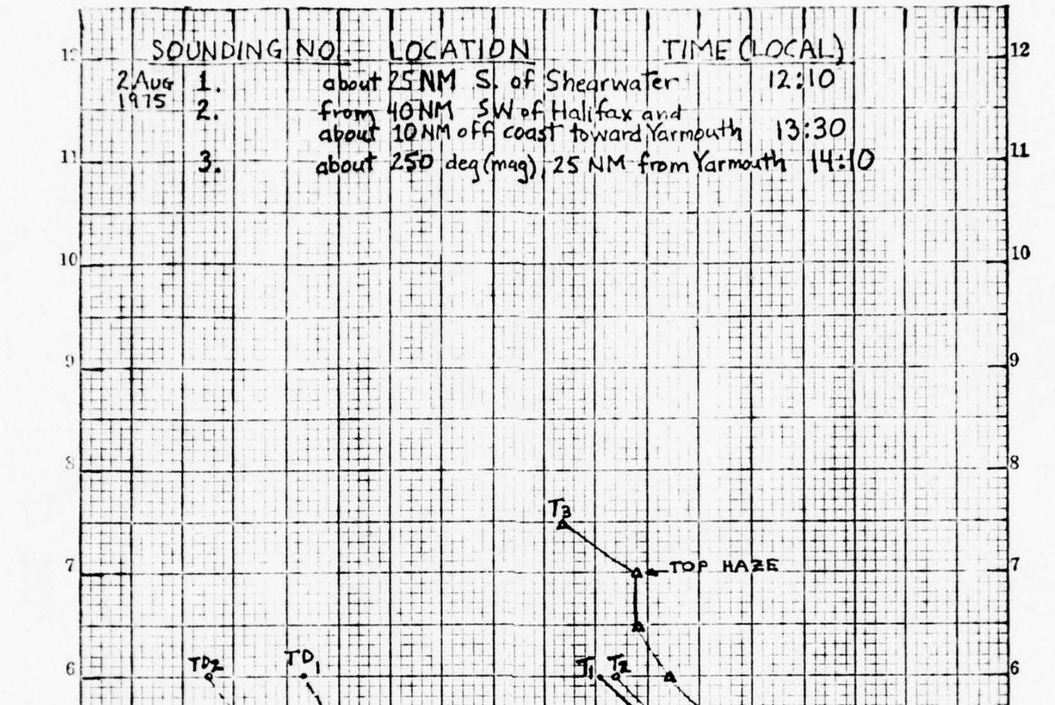


Sea Surface Temperature
Hayes - 1975

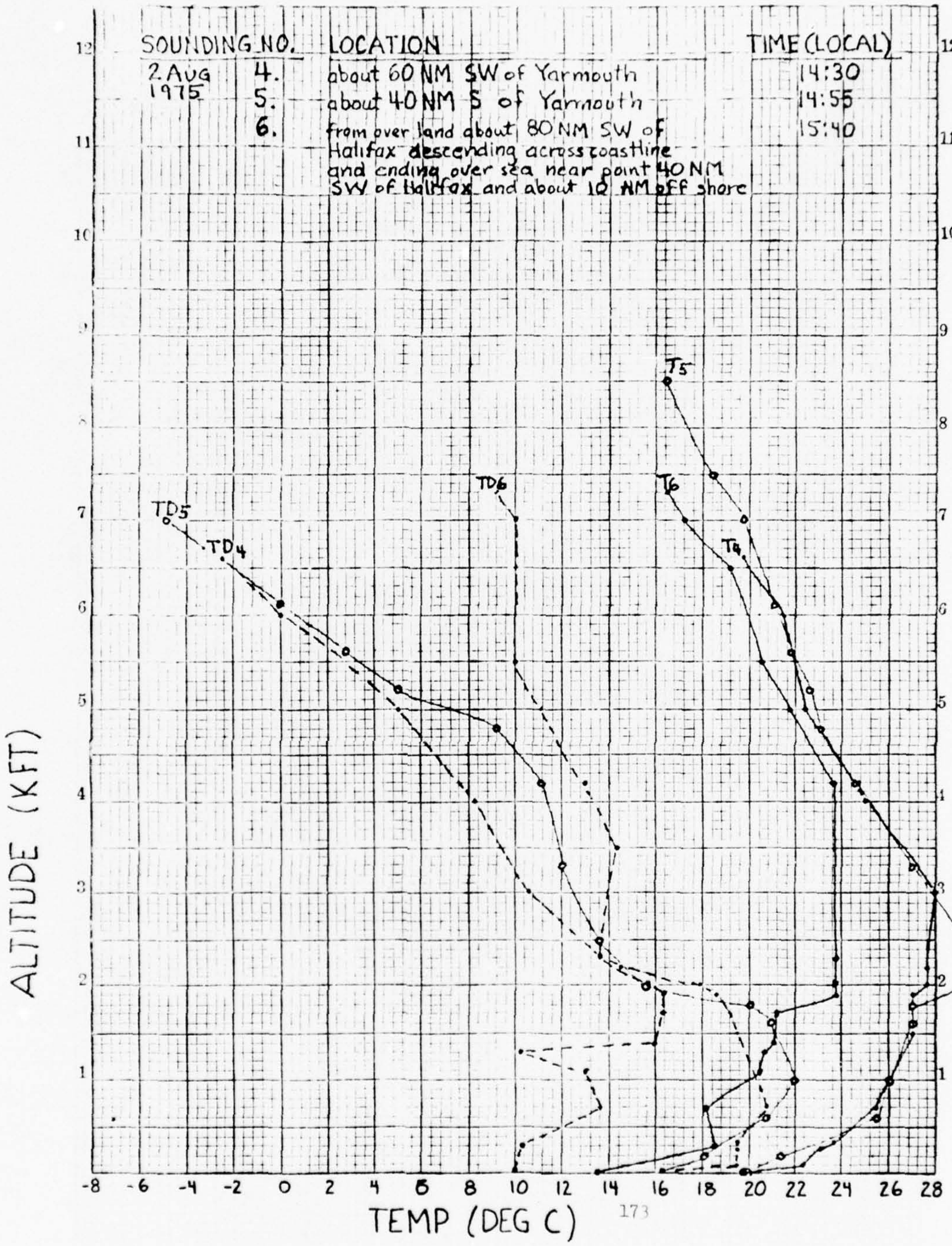
G. Schacher


1 Aug 75
1 AUG 1975
A. SOUNDING 1 DEPARTING SHEARWATER ~1300 LOCAL TIME
B. SOUNDINGS 2,3,4,5 IN VACINITY OF HAYES ~1400 LOCAL TIME
~100 MILES S.W. OF HALIFAX AND 25 MILES OFF SHORE
C. NO FOG
D. TEMP PROFILES SOLID LINES
E. DEW PT. PROFILES DASHED LINES
TEMP on NAVY AIRCRAFT
MERCURY THERMOMETER READ SIMULTANEOUSLY on BELLANCA
AUTOMATIC RECORDING SYSTEM (ROSEMONT PROBE) on BELLANCA
ALTITUDE (FT)
3000
2000
1000
T_1 T_2
T_3
T_4
T_5
TD_2
TD_3
TD_5
TD_4
WATER TEMP SHIP
DEW PT. SHIP
AIR TEMP SHIP
5
10
15
20
25
TEMPERATURE (DEG C)

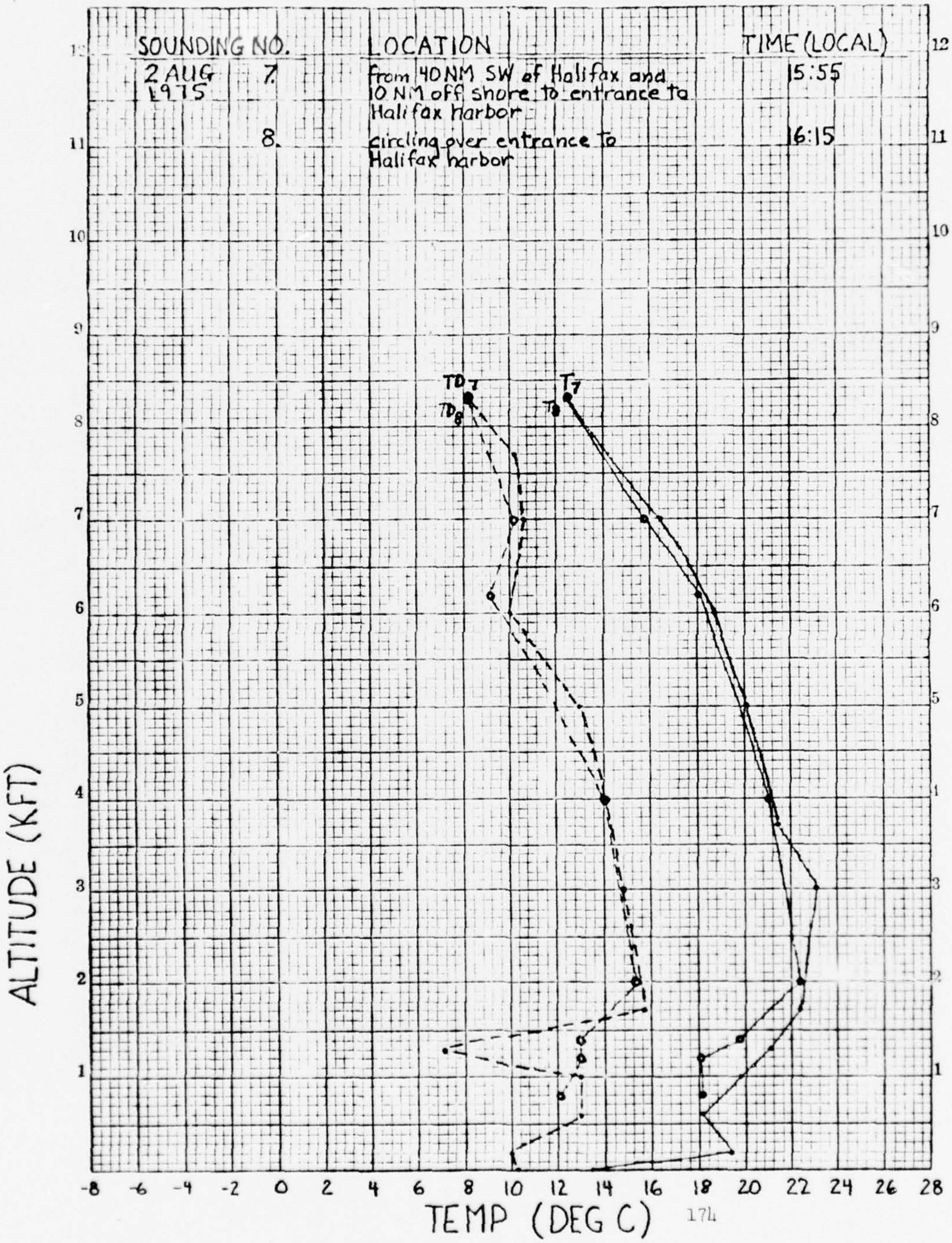
2 AUG 75

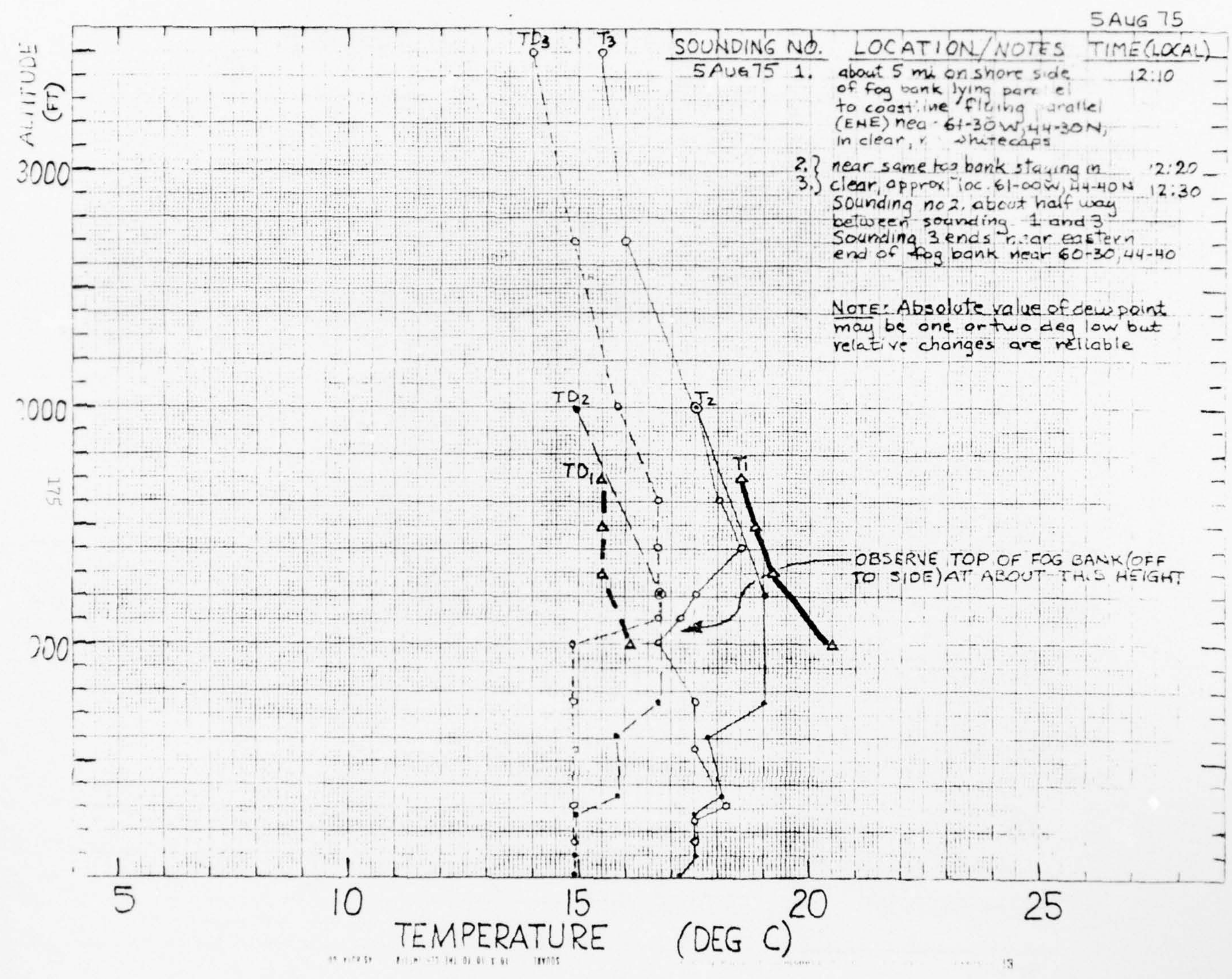

SOUNDING NO. LOCATION TIME (LOCAL)
2 Aug 1975
1. about 25 NM S. of Shearwater 12:10
2. from 40 NM SW of Halifax and about 10 NM off coast toward Yarmouth 13:30
3. about 250 deg (mag), 25 NM from Yarmouth 14:10
T3
TOP HAZE
TD2
TD1
T1
T2
TD3
ALTITUDE (KFT)
1
2
3
4
5
6
7
8
9
10
11
12
10
15
20
25
TEMPERATURE (DEG C)

2 AUG 75

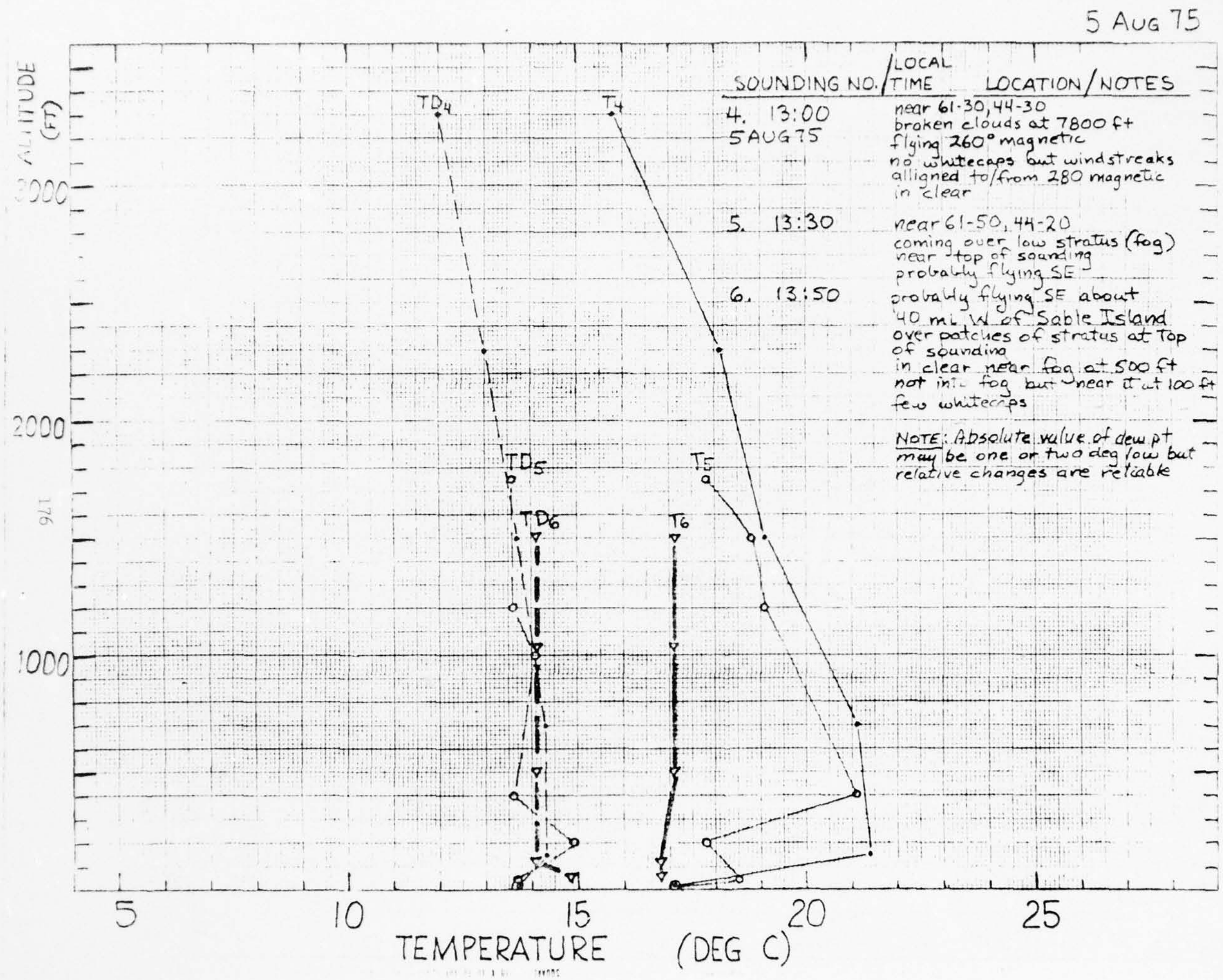

SOUNDING NO. LOCATION TIME (LOCAL)
2 AUG 1975 4. about 60 NM SW of Yarmouth 14:30
5. about 40 NM S of Yarmouth 14:55
6. from over land about 80 NM SW of Halifax descending across coastline and ending over sea near point 40 NM SW of Halifax and about 10 NM off shore 15:40
T5
T6
T4
TD5
TD4
TD6
ALTITUDE (KFT)
TEMP (DEG C)

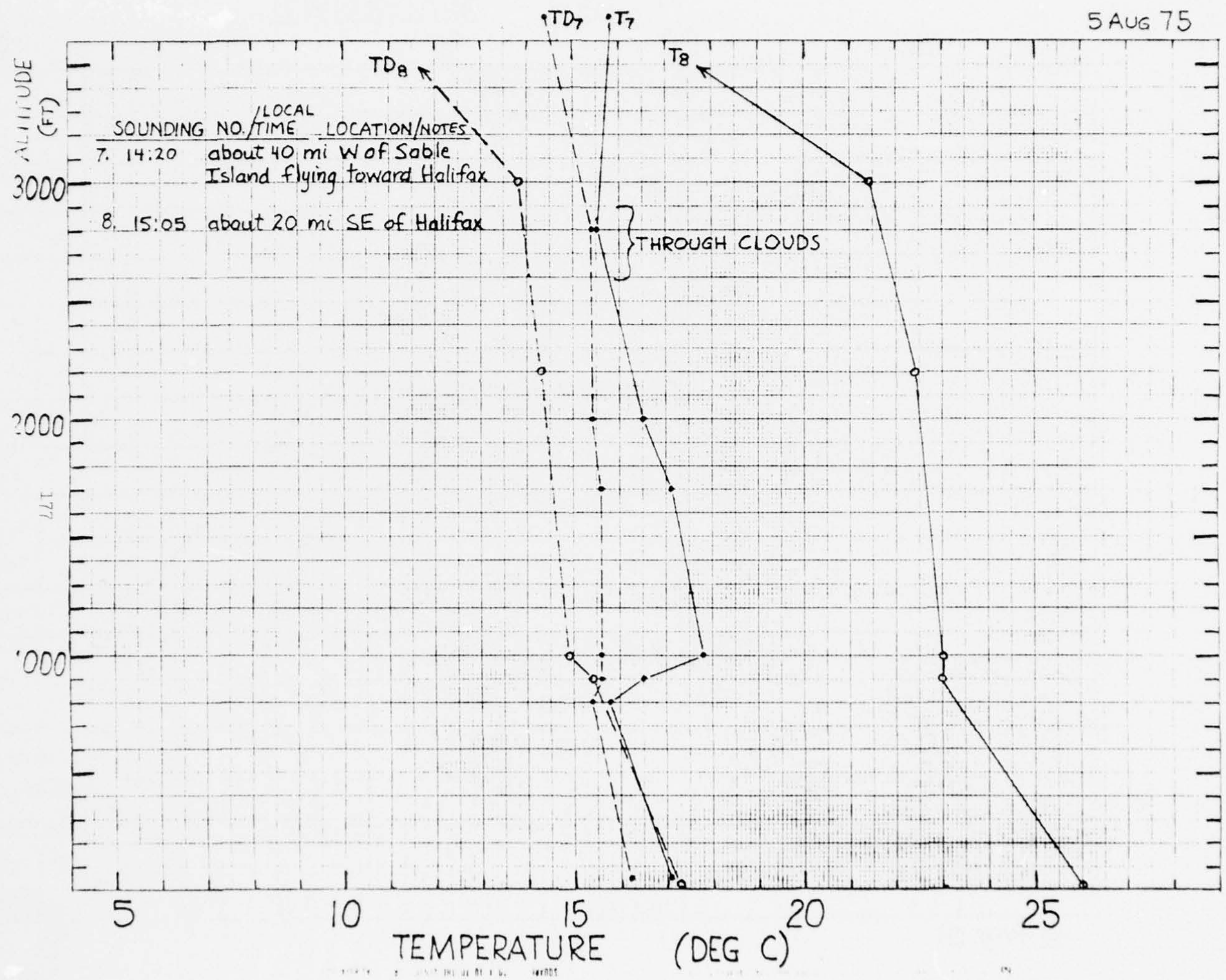
2 AUG 75


SOUNDING NO.
LOCATION
TIME (LOCAL)
2 AUG 1975
7.
from 40 NM SW of Halifax and 10 NM off shore to entrance to Halifax harbor
15:55
8.
circling over entrance to Halifax harbor
16:15
TD_7
TD_8
T_7
T_8
ALTITUDE (KFT)
TEMP (DEG C)
-8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
1 2 3 4 5 6 7 8 9 10 11 12

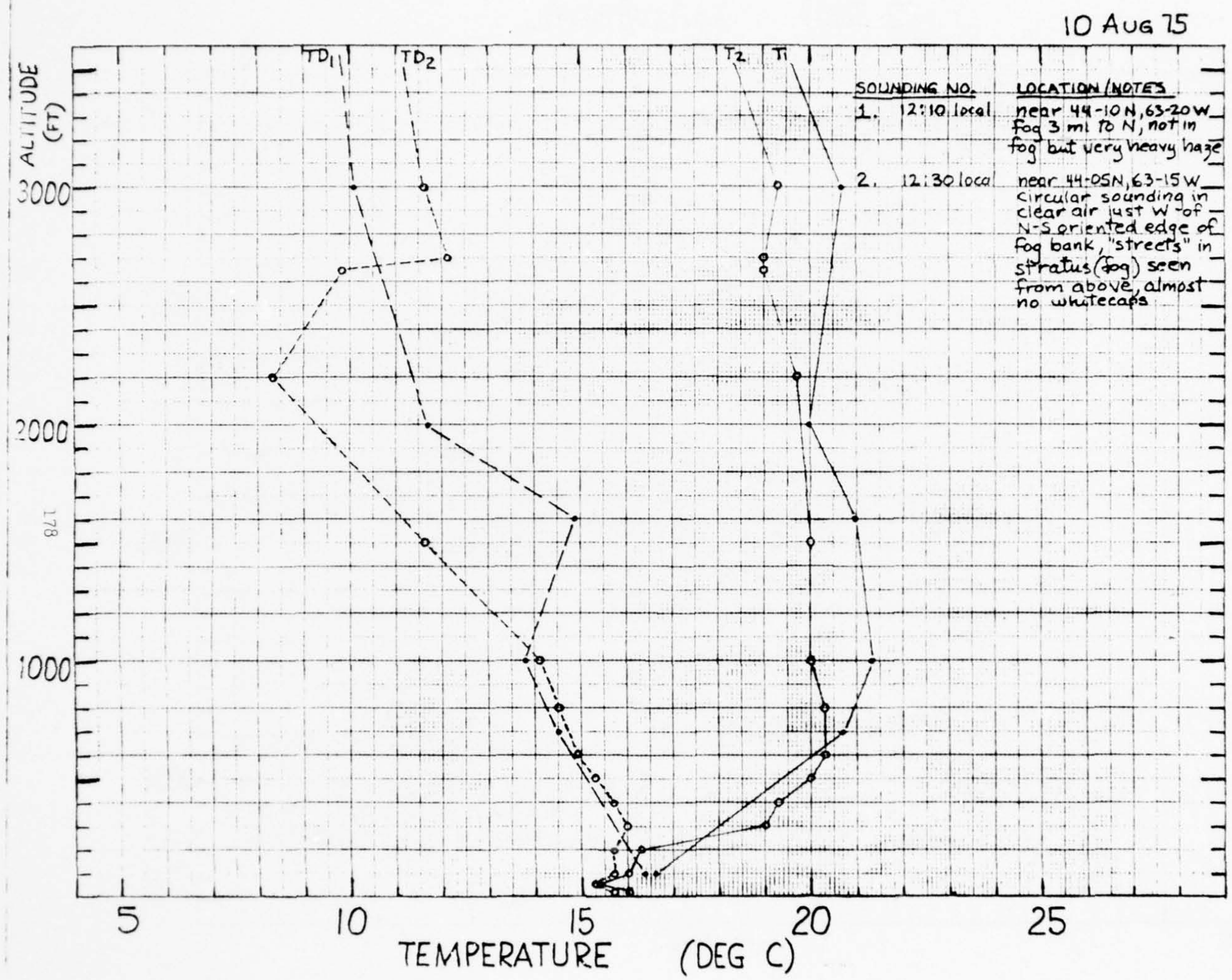


5 AUG 75
SOUNDING NO. LOCATION/NOTES TIME (LOCAL)
5AUG75 1. about 5 mi on shore side of fog bank lying parallel to coastline flying parallel (ENE) near 61-30W, 44-30N, in clear, whitecaps 12:10
2.} near same fog bank staying in 12:20
3.} clear, approx loc. 61-00W, 44-40N 12:30
Sounding no 2. about half way between sounding 1 and 3
Sounding 3 ends near eastern end of fog bank near 60-30, 44-40
NOTE: Absolute value of dew point may be one or two deg low but relative changes are reliable
OBSERVE TOP OF FOG BANK (OFF TO SIDE) AT ABOUT THIS HEIGHT
ALTITUDE (FT)
3000
2000
1000
TD3
T3
TD2
T2
TD1
T1
5
10
15
20
25
TEMPERATURE (DEG C)

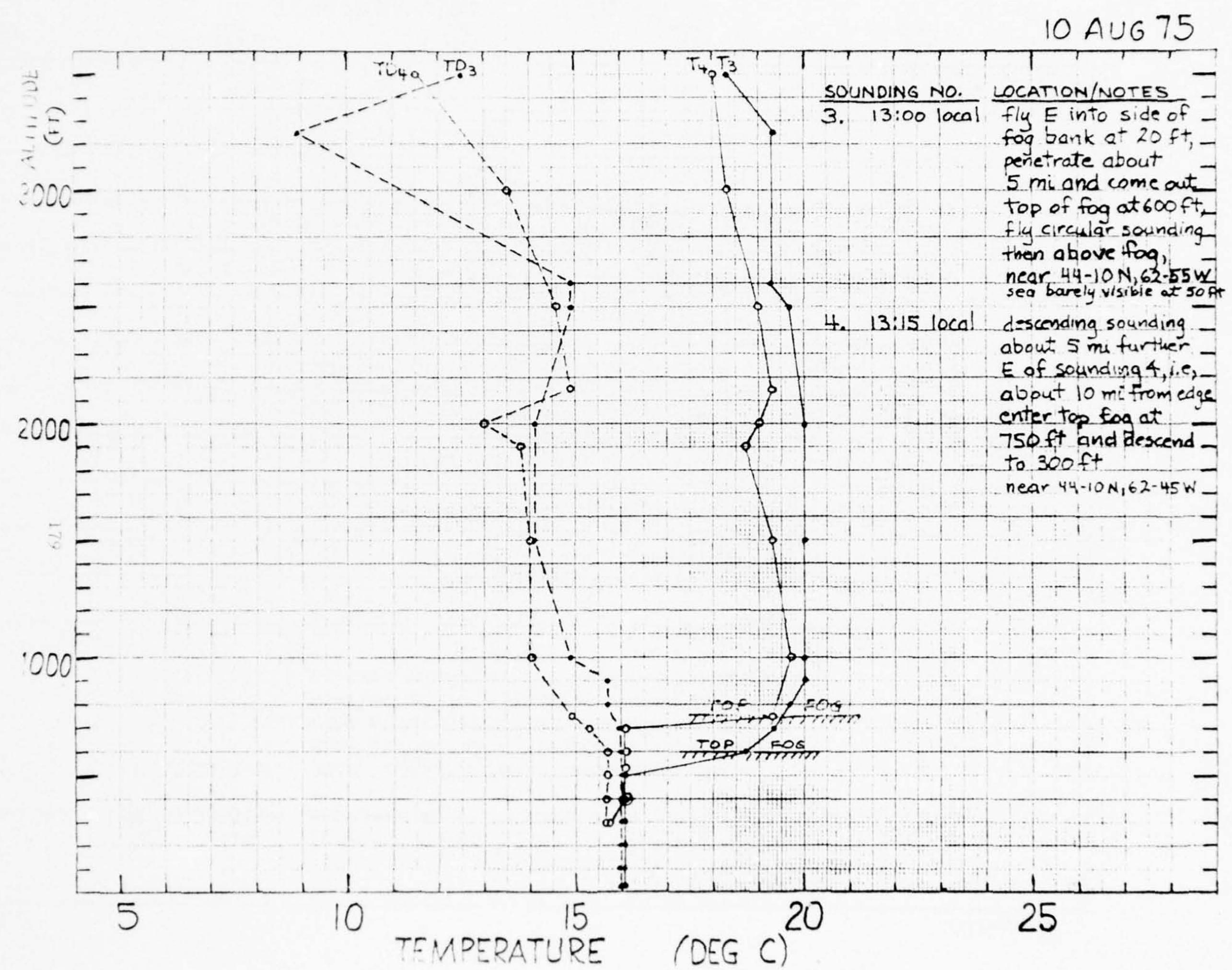

5 Aug 75
SOUNDING NO. / LOCAL TIME
LOCATION / NOTES
4. 13:00 5AUG75
near 61-30, 44-30
broken clouds at 7800 ft
flying 260° magnetic
no whitecaps but windstreaks
alligned to/from 280 magnetic
in clear
5. 13:30
near 61-50, 44-20
coming over low stratus (fog)
near top of sounding
probably flying SE
6. 13:50
probably flying SE about
40 mi. W of Sable Island
over patches of stratus at Top
of sounding
in clear near fog at 500 ft
not in fog but near it at 100 ft
few whitecaps
NOTE: Absolute value of dew pt
may be one or two deg low but
relative changes are reliable
TD4
T4
TD5
T5
TD6
T6
ALTITUDE (FT)
3000
2000
1000
5
10
15
20
25
TEMPERATURE (DEG C)
176



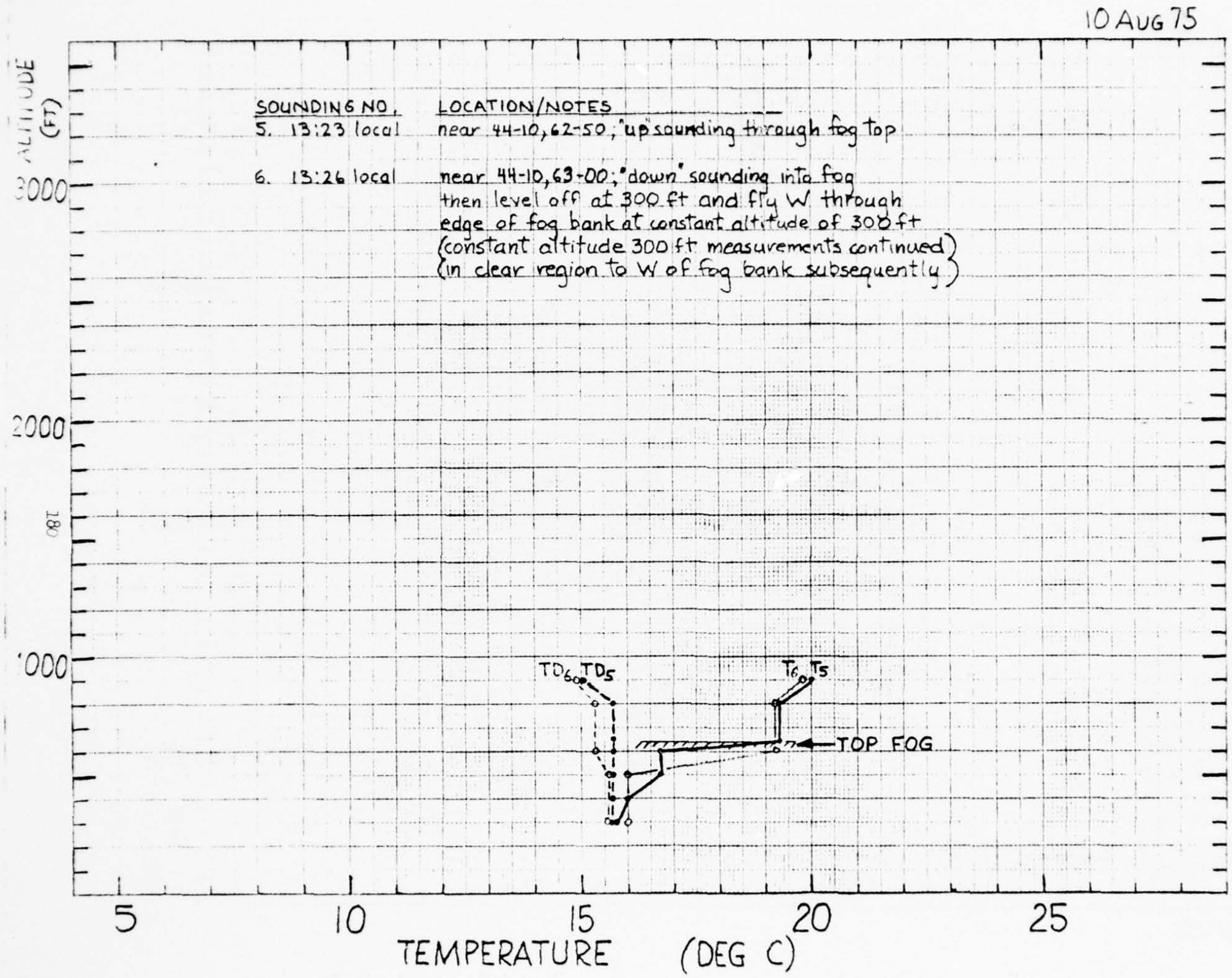
5 AUG 75
ALTITUDE (FT)
3000
2000
1000
5
10
15
20
25
TEMPERATURE (DEG C)
SOUNDING NO./LOCAL TIME LOCATION/NOTES
7. 14:20 about 40 mi W of Sable Island flying toward Halifax
8. 15:05 about 20 mi SE of Halifax
THROUGH CLOUDS
TD8
TD7
T7
T8



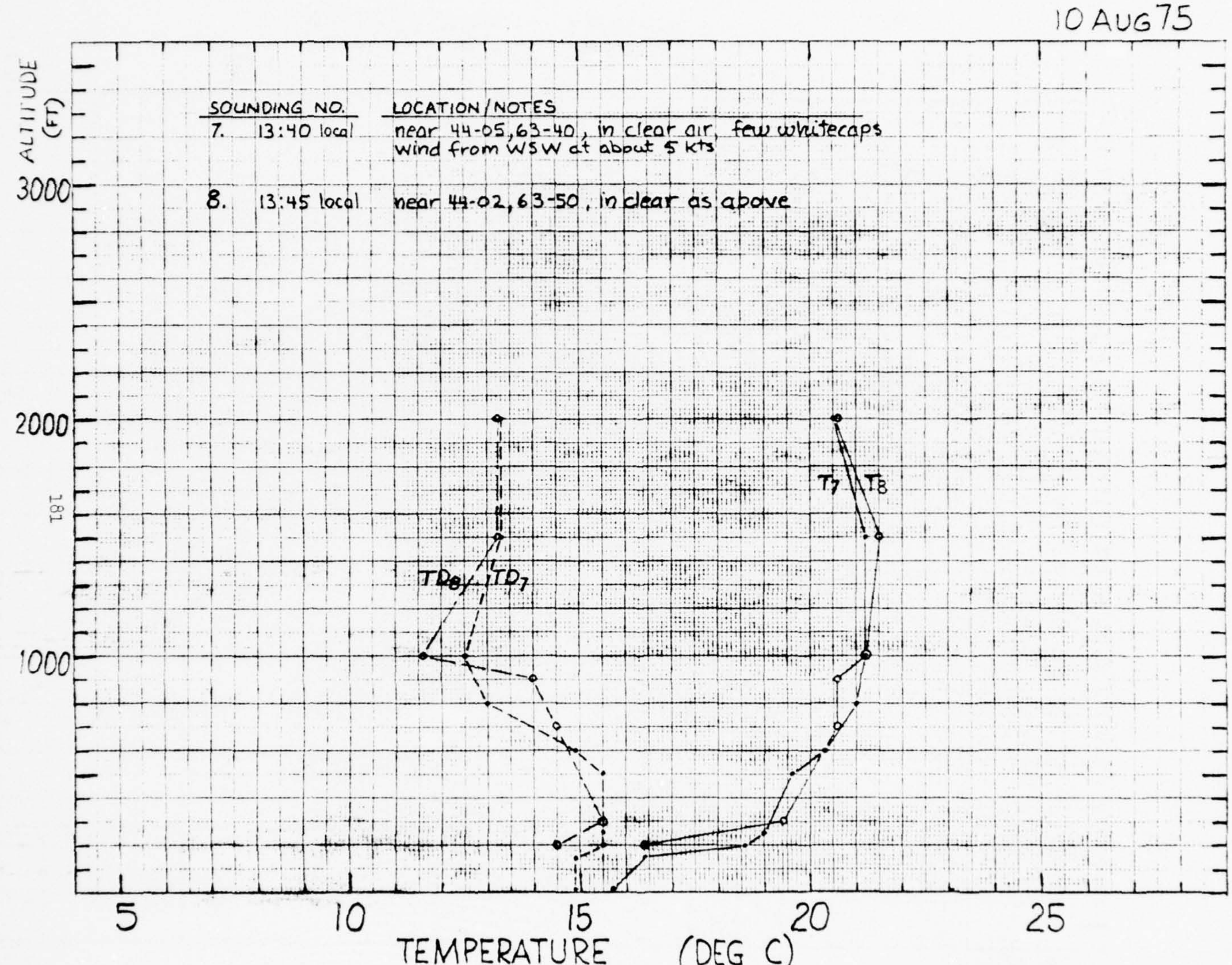
10 Aug 75
TD1
TD2
T2
T1
SOUNDING NO.
LOCATION/NOTES
1. 12:10 local
near 44-10N, 63-20W fog 3 mi to N, not in fog but very heavy haze
2. 12:30 local
near 44-05N, 63-15W circular sounding in clear air just W of N-S oriented edge of fog bank, "streets" in stratus (fog) seen from above, almost no whitecaps
ALTITUDE (FT)
3000
2000
1000
5
10
15
20
25
TEMPERATURE (DEG C)

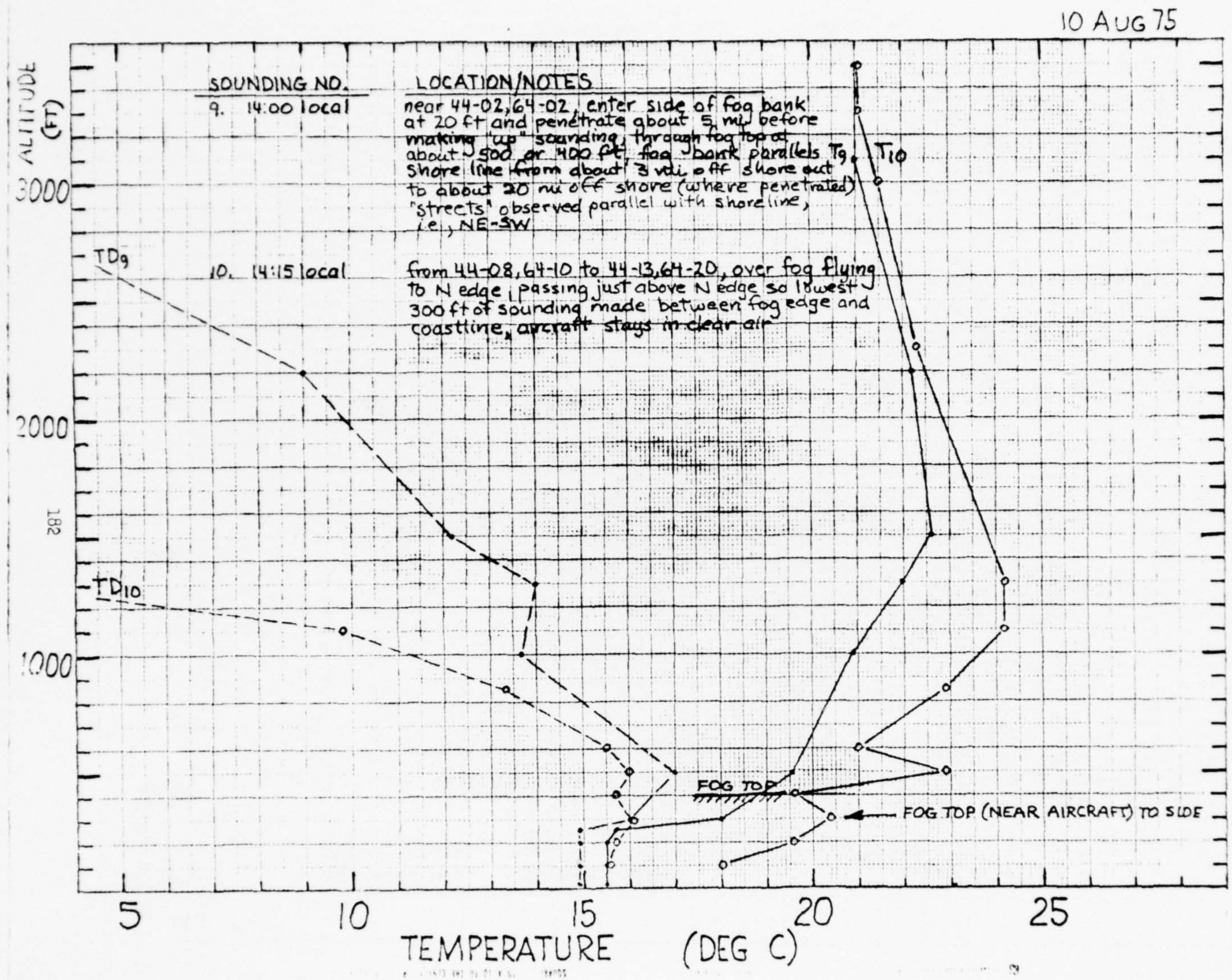


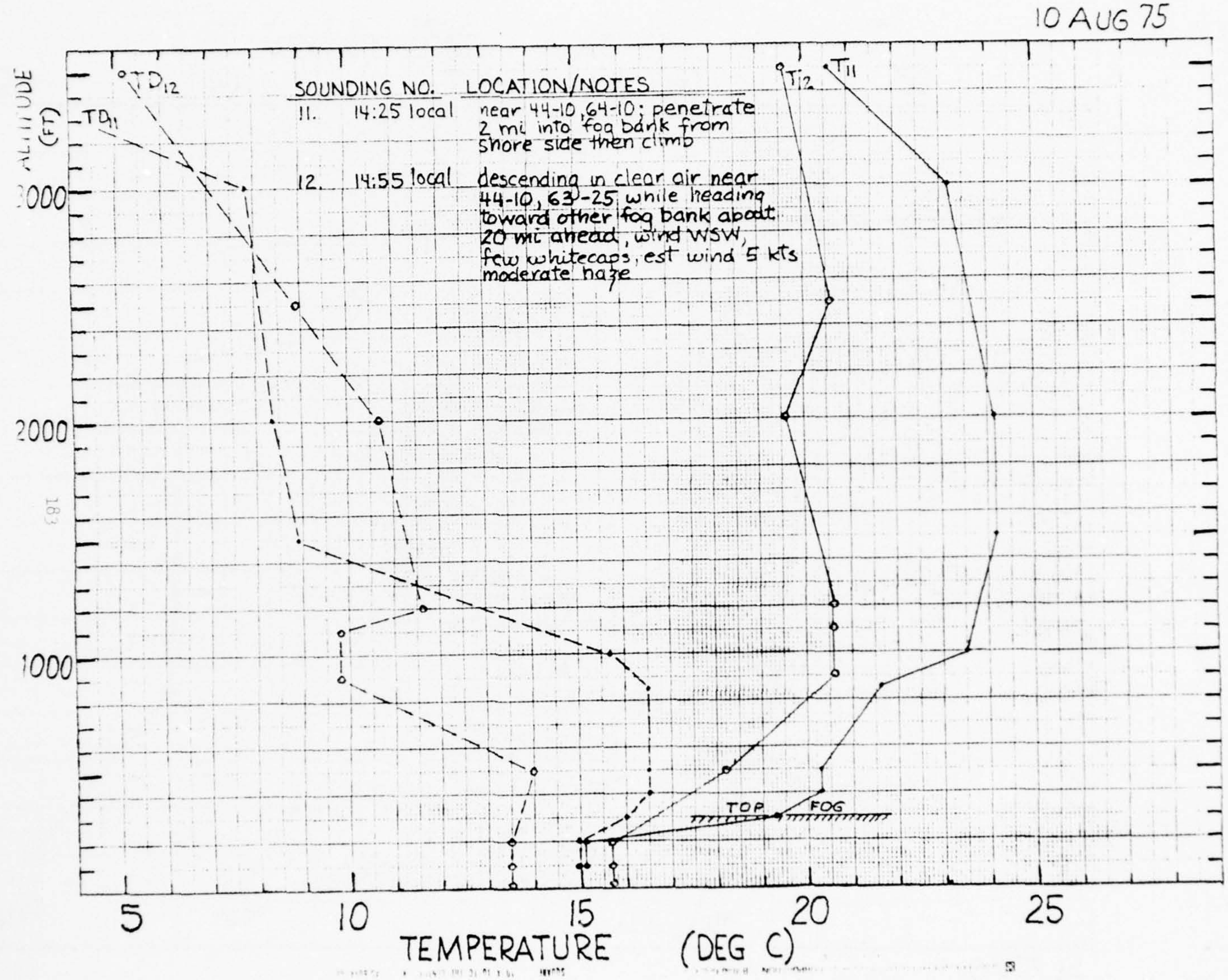
10 AUG 75
ALTITUDE (FT)
3000
2000
1000
TD4
TD3
T4
T3
SOUNDING NO.
LOCATION/NOTES
3. 13:00 local
fly E into side of fog bank at 20 ft, penetrate about 5 mi and come out top of fog at 600 ft, fly circular sounding then above fog, near 44-10N, 62-55W
sea barely visible at 50 ft
4. 13:15 local
descending sounding about 5 mi further E of sounding 4, i.e., about 10 mi from edge enter top fog at 750 ft and descend to 300 ft
near 44-10N, 62-45W
TOP FOG
TOP FOG
5
10
15
20
25
TEMPERATURE (DEG C)



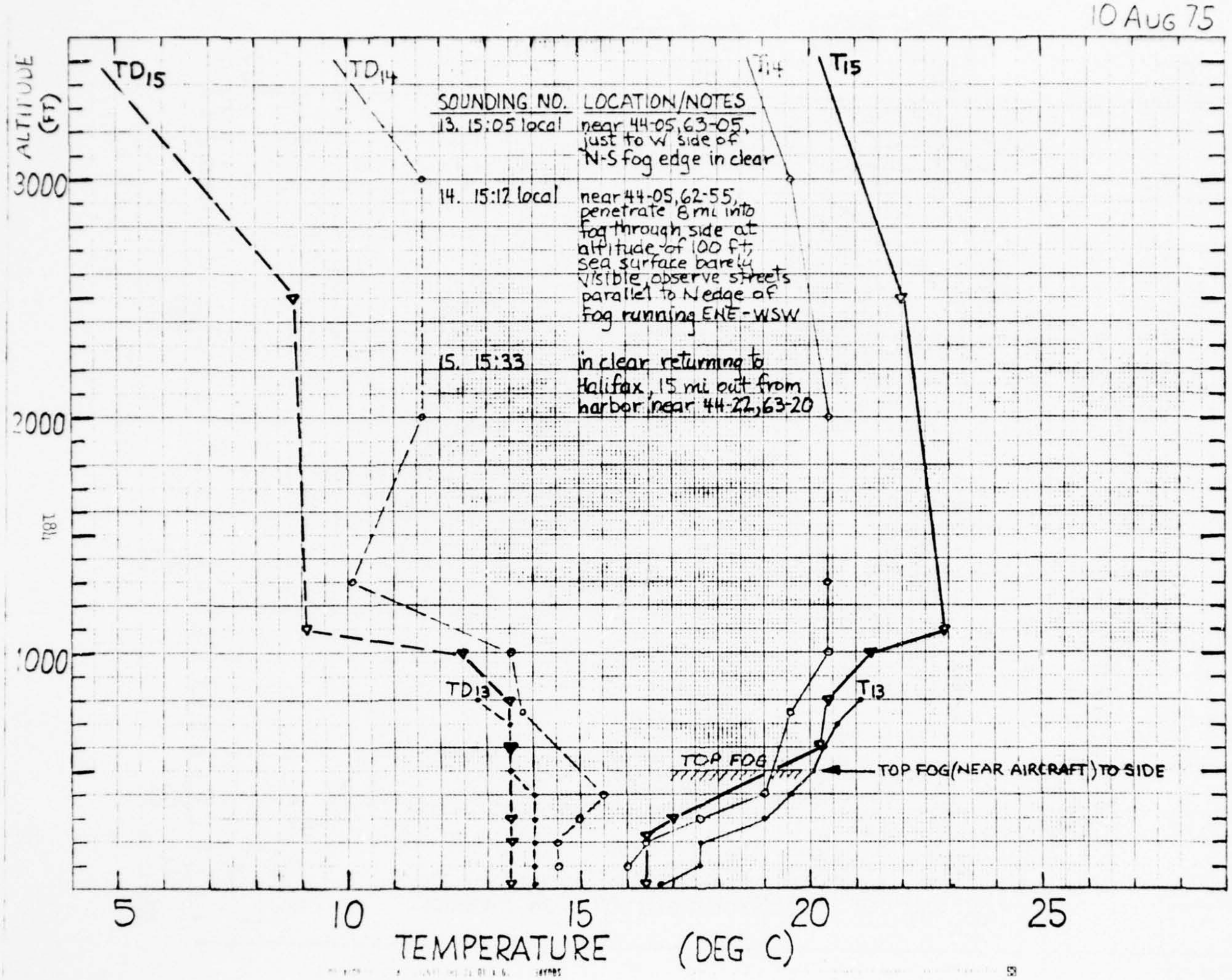
10 AUG 75
ALTITUDE (FT)
3000
2000
1000
SOUNDING NO.
LOCATION/NOTES
5. 13:23 local
near 44-10, 62-50; "up" sounding through fog top
6. 13:26 local
near 44-10, 63-00; "down" sounding into fog
then level off at 300 ft and fly W through
edge of fog bank at constant altitude of 300 ft
(constant altitude 300 ft measurements continued)
(in clear region to W of fog bank subsequently)
TD6
TD5
T6
T5
TOP FOG
5
10
15
20
25
TEMPERATURE (DEG C)

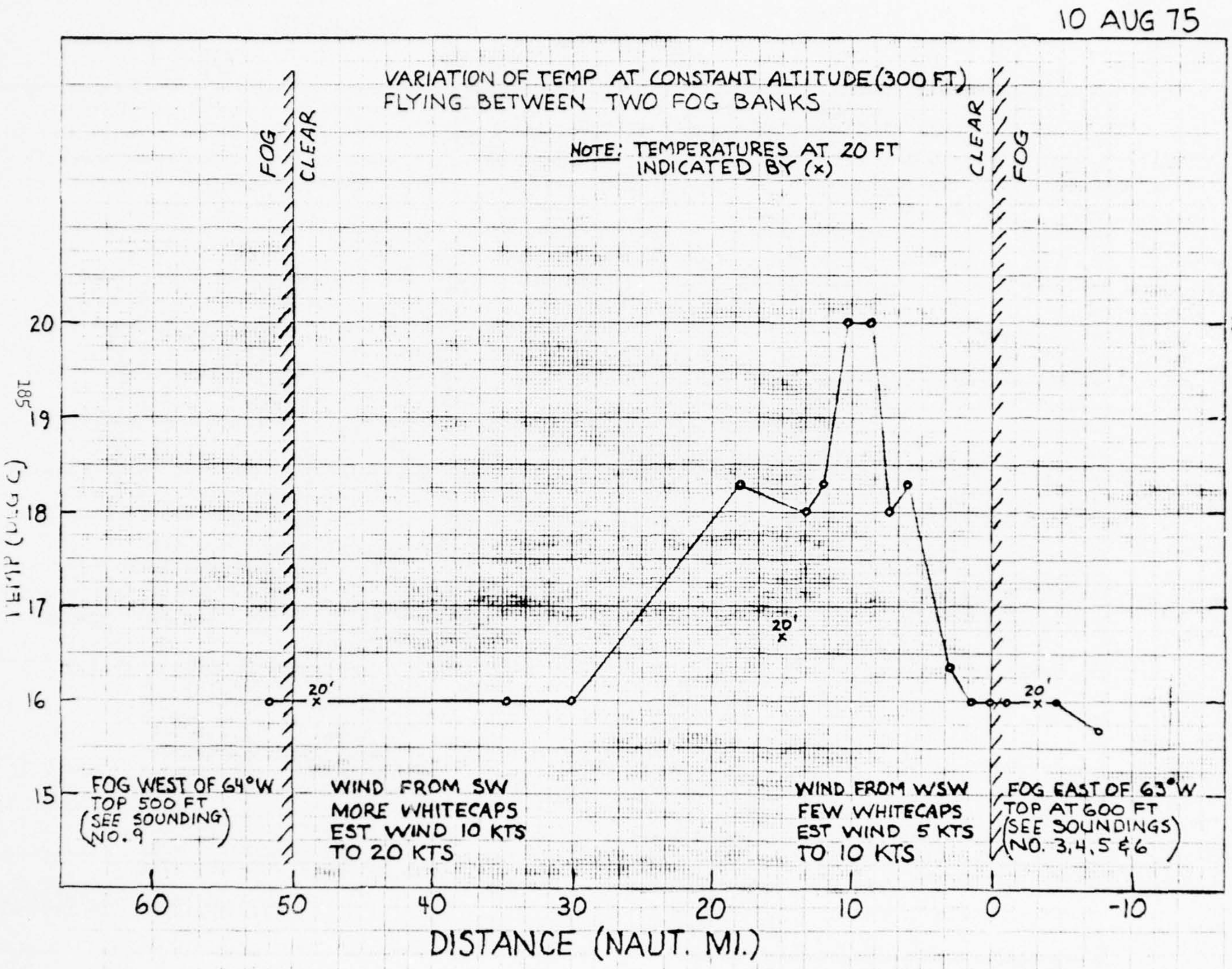

10 AUG 75
SOUNDING NO.
LOCATION/NOTES
7. 13:40 local
near 44-05, 63-40, in clear air, few whitecaps
wind from WSW at about 5 kts
8. 13:45 local
near 44-02, 63-50, in clear as above
ALTITUDE (FT)
3000
2000
1000
T_7
T_8
TD_8
TD_7
5
10
15
20
25
TEMPERATURE (DEG C)


10 AUG 75
SOUNDING NO.
LOCATION/NOTES
9. 14:00 local
near 44-02, 64-02, enter side of fog bank at 20 ft and penetrate about 5 mi before making "up" sounding, through fog top at about 300 or 400 ft, fog bank parallels shore line from about 3 mi off shore out to about 20 mi off shore (where penetrated) "streets" observed parallel with shoreline, i.e., NE-SW
10. 14:15 local
from 44-08, 64-10 to 44-13, 64-20, over fog flying to N edge, passing just above N edge so lowest 300 ft of sounding made between fog edge and coastline, aircraft stays in clear air
T_9
T_{10}
TD_9
TD_{10}
FOG TOP
FOG TOP (NEAR AIRCRAFT) TO SIDE
ALTITUDE (FT)
3000
2000
1000
5
10
15
20
25
TEMPERATURE (DEG C)

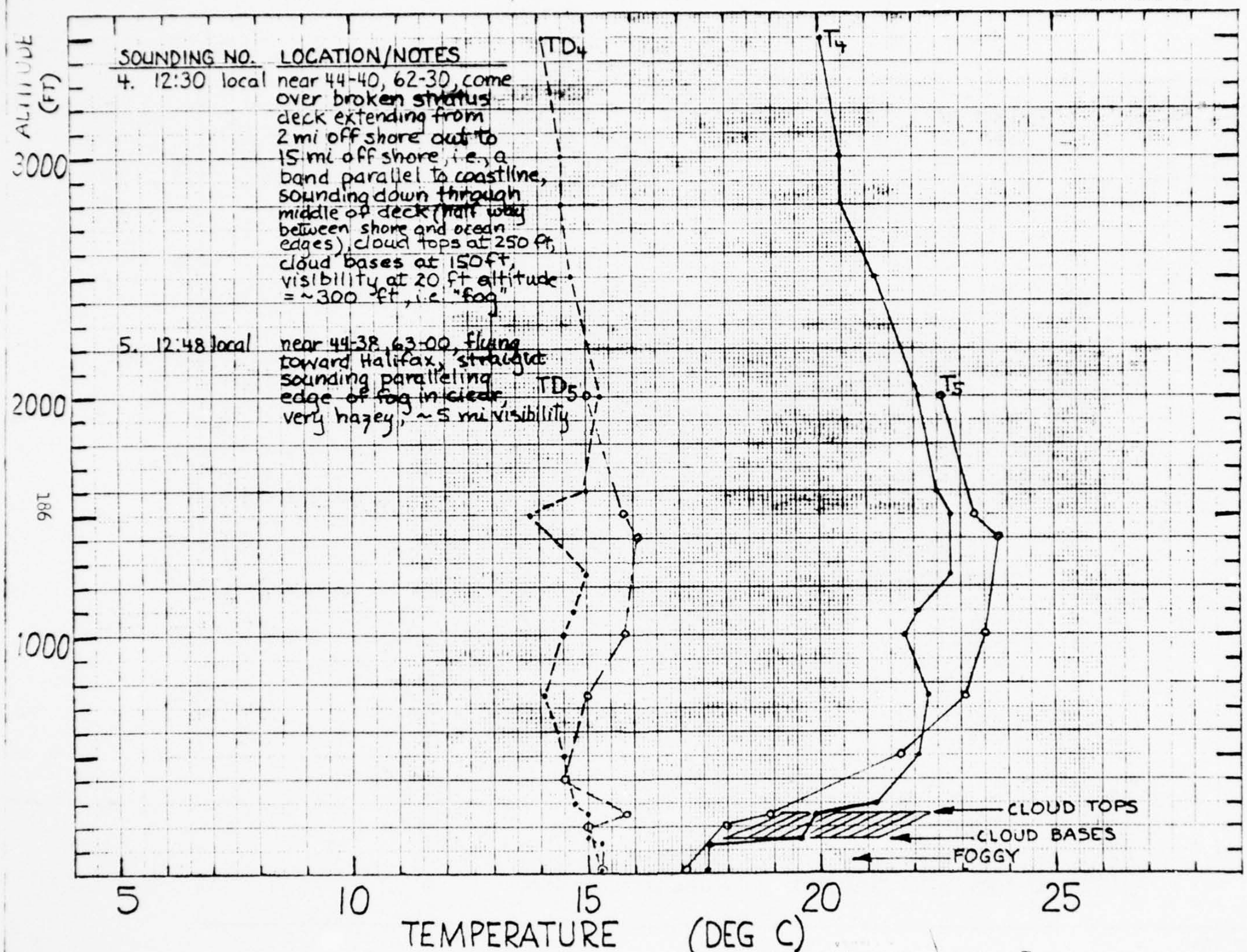


10 AUG 75
ALTITUDE (FT)
3000
2000
1000
TD12
TD11
T12
T11
SOUNDING NO. LOCATION/NOTES
11. 14:25 local near 44-10, 64-10; penetrate 2 mi into fog bank from shore side then climb
12. 14:55 local descending in clear air near 44-10, 63-25 while heading toward other fog bank about 20 mi ahead, wind WSW, few whitecaps, est wind 5 kts moderate haze
TOP FOG
5
10
15
20
25
TEMPERATURE (DEG C)


10 AUG 75
ALTITUDE (FT)
3000
2000
1000
TD15
TD14
TD13
T14
T15
T13
SOUNDING NO. LOCATION/NOTES
13. 15:05 local near 44-05, 63-05, just to W side of N-S fog edge in clear
14. 15:12 local near 44-05, 62-55, penetrate 8 mi into fog through side at altitude of 100 ft, sea surface barely visible, observe streets parallel to N edge of fog running ENE-WSW
15. 15:33 in clear returning to Halifax, 15 mi out from harbor near 44-22, 63-20
TOP FOG
TOP FOG (NEAR AIRCRAFT) TO SIDE
5
10
15
20
25
TEMPERATURE (DEG C)

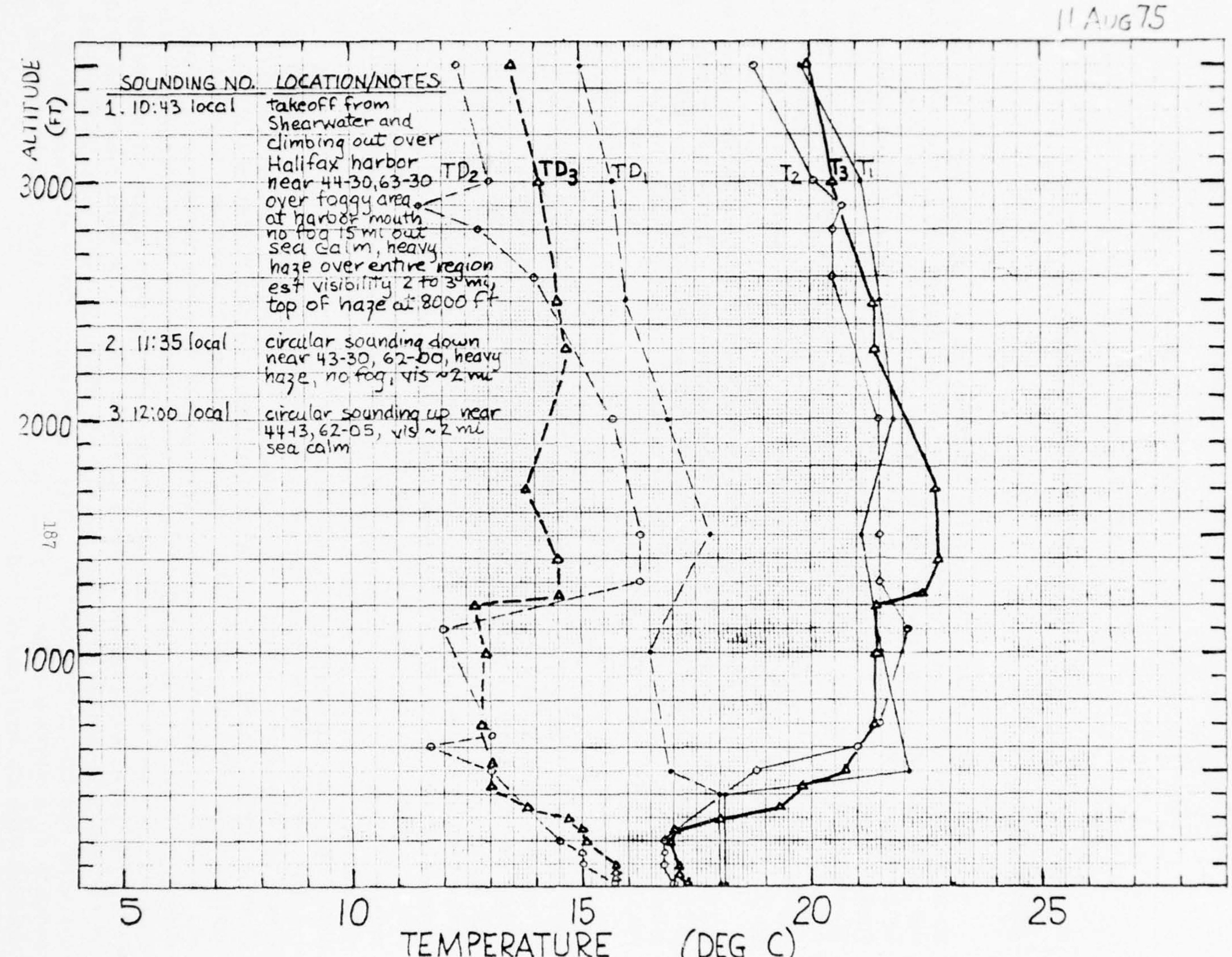

10 AUG 75
VARIATION OF TEMP AT CONSTANT ALTITUDE (300 FT.)
FLYING BETWEEN TWO FOG BANKS
NOTE: TEMPERATURES AT 20 FT
INDICATED BY (x)
FOG
CLEAR
CLEAR
FOG
20'
20'
20'
FOG WEST OF 64°W
TOP 500 FT
(SEE SOUNDING NO. 9)
WIND FROM SW
MORE WHITECAPS
EST WIND 10 KTS
TO 20 KTS
WIND FROM WSW
FEW WHITECAPS
EST WIND 5 KTS
TO 10 KTS
FOG EAST OF 63°W
TOP AT 600 FT
(SEE SOUNDINGS NO. 3, 4, 5 & 6)
TEMP (DEG C)
15
16
17
18
19
20
60
50
40
30
20
10
0
-10
DISTANCE (NAUT. MI.)

11 Aug 75



SOUNDING NO. LOCATION/NOTES
4. 12:30 local near 44-40, 62-30, come over broken stratus deck extending from 2 mi off shore out to 15 mi off shore, i.e., a band parallel to coastline, sounding down through middle of deck (half way between shore and ocean edges), cloud tops at 250 ft, cloud bases at 150 ft, visibility at 20 ft altitude = ~300 ft, i.e. "fog"
5. 12:48 local near 44-38, 63-00, flying toward Halifax, straight sounding paralleling edge of fog in clear, very hazey, ~5 mi visibility
ALTITUDE (FT)
3000
2000
1000
TD4
TD5
T4
T5
CLOUD TOPS
CLOUD BASES
FOGGY
5
10
15
20
25
TEMPERATURE (DEG C)

186


11 AUG 75
ALTITUDE (FT)
3000
2000
1000
SOUNDING NO. LOCATION/NOTES
1. 10:43 local takeoff from Shearwater and climbing out over Halifax harbor near 44-30,63-30 over foggy area at harbor mouth no fog 15 mi out sea calm, heavy haze over entire region est visibility 2 to 3 mi, top of haze at 8000 ft
2. 11:35 local circular sounding down near 43-30, 62-00, heavy haze, no fog, vis ~2 mi
3. 12:00 local circular sounding up near 44-13, 62-05, vis ~2 mi sea calm
TD2
TD3
TD1
T2
T3
T1
5
10
15
20
25
TEMPERATURE (DEG C)

BOUNDARY LAYER MEASUREMENTS OF TEMPERATURE, WATER VAPOR AND

PRESSURE DURING THE 1975 FOG CRUISE OF THE USNS HAYES

Stuart G. Gathman

U. S. Naval Research Laboratory

INTRODUCTION

Vertical soundings of potential temperature and mixing ratio are essential to our understanding of fog formation. During August 1975, the USNS HAYES was on a fog study cruise off of the coast of Nova Scotia and Newfoundland. In connection with this study a series of kite balloon soundings were made. These flights utilized a new radiosonde design which gives accurate values of atmospheric pressure altitude, dry air temperature, and wet bulb temperature. The data from this device is both stored in permanent form on magnetic tape and fed directly into a digital computer for instant real time analysis which is displayed in graphic form on a C. R. terminal.

The form of the transmitted data is the period of time between any two pulses of audio modulated RF of the same audio tone. The channels are differentiated by the tone of the audio modulation. The period between the pulses is set long enough so as to be capable of being timed with a stop watch for sufficient data accuracy.

The pressure sensor is an integrated circuit which senses absolute pressure and produces an output proportional to this pressure. The sensitivity of the system was obtained by comparing the readings obtained by connecting both the radiosonde sensor and a precision pressure gauge to a partially evacuated tank. The sensitivity of a particular radiosonde was shown to be constant throughout many flights. However, because of changing atmospheric pressure, the output of the radiosonde at the surface level changes correspondingly. Therefore a zero adjustment must be made for each flight. This was done by flying the device at mast height and noting the output. Thus the linear characteristics of this device allows the entire calibration curve to be defined by a point, (the mast height reading) and the slope (the sensitivity of the device).

The dry air temperature and the wet bulb temperature are obtained by identical circuitry. Both utilize similar thermisters*. The electronics gives a period which is directly proportional to the resistance of the thermisters. The use of COS/MOS circuitry keeps the battery consumption low and provides a minimum of current through the sensing thermisters. Both of the thermisters are shielded from the sun's radiation by a common radiation shield. The wet bulb is enclosed within a cotton wick which is wetted by distilled water supplied by a small plastic vial. The psychrometeric effect on the wet bulb depends on the ventilation which in this case is provided by the wind and the ship's motion. This is adequate for most practical cases because of a minimum relative wind flow which is necessary to launch the kite balloon with an instrument load.

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*ML-405A/AM or ML-419/AMT-4

The nominal calibration curves for the temperature characteristics of the thermisters is adequate for most work. These seem to always be within plus or minus 1 degree C. However the accuracy of the system on a well mixed atmosphere shows that a scatter of dry air temperatures at a given altitude has a standard deviation of approximately .2 degree C. Therefore to obtain a more precise absolute calibration the nominal calibration curves of the thermisters must be individually modified to a small extent to bring the temperature measurement into line with standard thermometers. The figures shown in this report had both the dry and the wet bulb thermisters calibrated with respect to a Cambridge dewpoint hygrometer system.

The data was collated by collecting and averaging for each minute of flight all dry bulb temperature, wet bulb temperature and pressure data transmitted by the radiosonde. Scatter plots of dry and wet bulb temperature against pressure were made for each flight. Such presentations for a well mixed uniform atmosphere show an uncertainty in temperature of plus or minus .2 degrees C at a given altitude. In the case of structured atmosphere however where parameters are changing rapidly as the ship moves over changing surface waters, the ascent curve may be different from the descent curve. It was also noted that setting the kite balloon at one particular altitude showed that the spread in the data values increases as time increases.

Therefore the curves presented in figures 1 through 15 in this report are of the form of a least squares fitted 3rd order polynomial. The curve represents either a single ascent or descent which occured during the time interval noted. The author feels that these polynomials best represent the important features of the flights namely lapse rates and inflection points in unambiguous terms.

Also shown in these curves are the average of some of the ship board data which was recorded at the same time. The altitude location of the symbols are their approximate geometeric altitude. No attempt is made to give corrected altitudes which take into effect the air flow characteristics about the ship. The large full circles represent the data obtained by the Cambridge systems model 110 S shipboard dewpointer and dry air temperature probe located on a tower on top of the pilot house of the USNS HAYES. The small circles represent data taken by Gordon Schacher of the Naval Post Graduate School using quartz thermometers. One was located on a small tower on the port bow of the ship while the other was located on the forward mast. The large half circle represents the sea surface temperature indicated by the Barnes PRT-5 infrared thermometer focused on a patch of undisturbed water off of the starboard bow. The small half circle represents the sea surface temperature measured by Schacher using a quartz thermometer towed through the top layers of the sea in the wake of the ship.

A number of subsequent flights were made after the extensive data taking period in leg 1 and throughout legs 2 and 3 of the cruise. Certain of these flights differ substantially both as to geography and in weather conditions from the profiles made during the high fog incidence which occurred during the first part of leg 1 and are offered here as a base line by which to compare the fog related profiles.

During legs 2 and 3 of the cruise a more deliberate experimental pace was possible because of the reduction in the number of fog alerts. Consequently more detailed profiles of the marine boundary layer were made and this increased detail has suggested a slightly different plotting format of the profile data.

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MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)

1975 S G GATHMAN, R E LARSON

UNCLASSIFIED NL

3 OF 7

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Figures 16 through 27 are the individual potential temperature profiles for each ascent or descent. Some of the flights contained up to 6 consecutive ascents and descents; each part of which is presented separately because of the unusual changes in the structure of the profile from one pass through the atmosphere to the next, each separated from the other by no more than 1/2 hour. Such detail in both time and space is difficult to obtain in mid ocean by techniques other than the tethered balloon. The same instrument makes each of the profiles in a flight and the wet and dry temperatures are checked at the bottom of each profile by the shipboard temperature and dewpoint instrumentation. The resolution of the radiosonde is plus or minus 0.15°C consequently the differences in consecutively made profiles greater than this margin of error are real. They differ because each profile is made in a slightly different portion of the boundary layer (the ship travels approximately 5 miles between each of the profiles).

Figures 28, 29, and 30 represent plots of the average mixing ratios measured throughout the various ascents and descents of each flight. As these data are calculated from the differences between dry and wet bulb temperature measurements, error margins of up to plus or minus 1/2 g/kg in mixing ratio can exist in this data. Significant changes in mixing ratio profiles between consecutive profiles were not observed and therefore these plots are presented in an averaged form.

FIGURE CAPTIONS

Fig. 1) Flight 1 started at 21:16 GMT and represents a profile made in the following 26 minutes. The cloud cover was approximately 90% cirrus. No humidity measurements were made on this flight.

Fig. 2) Flight 2 started at 21:01 GMT and represents 50 minutes of flight. The sky was mostly clear during the flight. No humidity measurements were made on this flight.

Fig. 3) Flight 3 was started at 0:24 GMT on 3 August 1975. It represents 28 minutes of flight. This flight occurred in fog but no humidity measurements were made.

Fig. 4) Flight 4 was started at 13:35 GMT on 5 August 1975 and this figure represents 40 minutes of flight. A low thin fog layer was lying over the water. An observer standing on the 04 level of the ship saw blue sky overhead. No humidity measurements were made on this flight.

Fig. 5) Flight 5 was started at 16:37 GMT on 5 August 1975. It represents 39 minutes of flight. Both humidity and temperature were measured on this flight. The sky was clear overhead with bright sunshine.

Fig. 6) Flight 6 started at 11:27 GMT on 7 August 1975. It represents 32 minutes of flight time. The sky was completely covered with low level stratus clouds and periodic patches of fog occurred at the surface. No humidity measurements were made on the flight. The flight was made just as the ship left a fog bank.

Fig. 7) Flight 7 started at 21:57 GMT on 7 August 1975. The flight covered a time period of 22 minutes. This flight is the first in a series of flights to be made in the area south of Newfoundland. The flight was made in fog but no humidity measurements are available from the flight.

Fig. 8) Flight 8 was started at 12:36 GMT on 8 August 1975 and this figure represents 34 minutes of flight. Both mixing ratio and potential temperature measurements are shown here. The flight took place in a fog event.

Fig. 9) Flight 9 was started at 23:35 GMT on 8 August 1975. This 20 minute flight took place during a short fog event.

Fig. 10) Flight 10 started at 12:30 GMT on 9 August 1975. It lasted for 45 minutes. Heavy drizzle with a solid stratus cloud deck overhead were encountered on this flight. The humidity channel stopped working half way through the ascent.

Fig. 11) Flight 11 started at 17:30 GMT on 9 August 1975. A low level heavy stratus deck overhead was encountered on this flight.

Fig. 12) Flight 12 started at 23:30 GMT on 9 August 1975. It lasted for 1/2 hour and there were clear skies overhead.

Fig. 13) Flight 13 started at 12:52 GMT on 10 August 1975 and lasted for 78 minutes. A stratus deck was encountered on this flight with the kite balloon definitely observed entering into the cloud at 175 meters altitude.

Fig. 14) Flight 14 started at 22:26 GMT on 10 August 1975 and lasted for 29 minutes. The flight occurred at the conclusion of a fog event. A stratus cloud covered the sky at this time but no drizzle was observed.

Fig. 15) Flight 15 started at 4:44 GMT on 11 August 1975 and lasted for 30 minutes. The flight took place while a low fog covered the sea surface but at the same time some stars were dimly visible overhead.

Fig. 16) This figure shows the potential temperature profiles on the ascent and descent of flight 16. The ascent was made as the ship was in a low stratus condition. The stratus appeared to be lowering to the surface by the time the descent was made. The mixing ratio profile of this flight appears in figure 28.

Fig. 17) This profile was made when the surface visibility was 3800 meters with no clouds visible. The true wind here was 5 knots coming from 330°. The mixing ratio profile of this flight appears in figure 28.

Fig. 18) Flight 18 was made offshore of Nova Scotia under clear conditions. A 2% cumulus sky cover was observed at the time and the surface visibility was greater than 10 km. Real changes in the temperature structure of the lower boundary layer appear in this sequence of profiles.

Fig. 19) Flight 19 shows real changes in the structure of the temperature in the lower boundary layer in sunny almost cloudless conditions. The mixing ratio profile from flight 19 appears in figure 29.

Fig. 20) These profiles were made in clear sky conditions with the horizon sharply visible. The mixing ratio profile from flight 20 is shown in figure 29.

Fig. 21) These profiles were made in clear sky conditions. The mixing ratio profile from flight 21 is shown in figure 29.

Fig. 22) These profiles were made in dark and overcast conditions where the sun occasionally breaks through. The mixing ratio profile from flight 22 is shown in figure 29.

Fig. 23) These profiles were from flight 28, the first good flight made on the ocean crossing. Heavy weather precluded measurements earlier in the crossing track. The visibility here was 2800 meters. There was rain observed and a stratus deck covered the entire sky. The true wind at this time was 7 knots from 90°. The mixing ratio profile of this flight is shown in figure 30.

Fig. 24) These profiles were made during flight 29. Fog and stratus occurred at this time with a surface visibility of 300 meters. The mixing ratio profile of this flight is shown in figure 30.

Fig. 25) This profile was obtained from flight 31 and was made in non-foggy, overcast conditions. The mixing ratio profile of this flight is shown in figure 30.

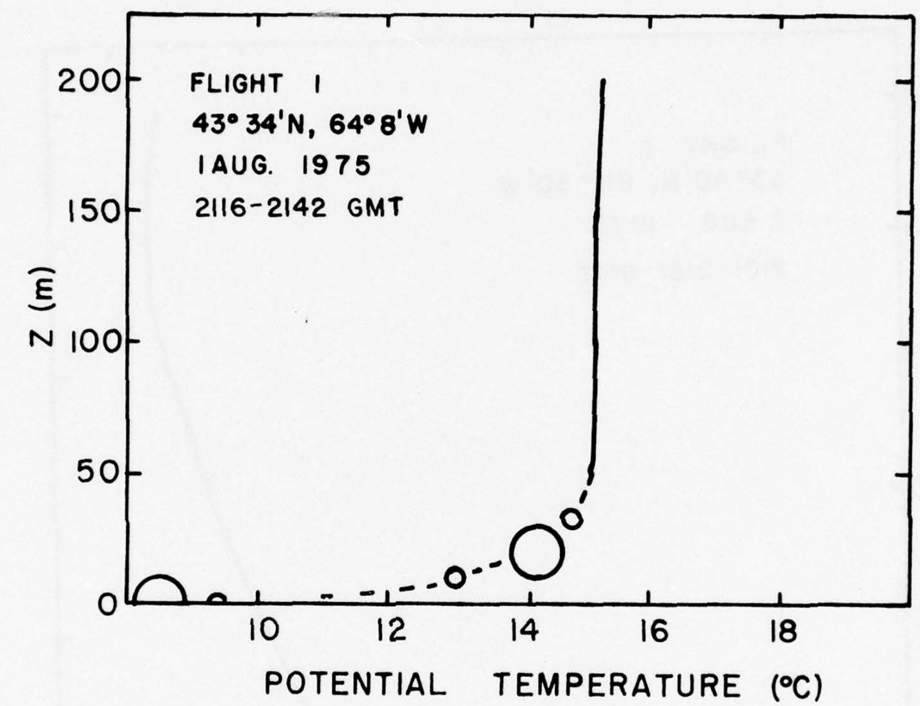
Fig. 26) These profiles were made during flight 32 near the Irish coast. The mixing ratio profile of this flight is shown in figure 30.

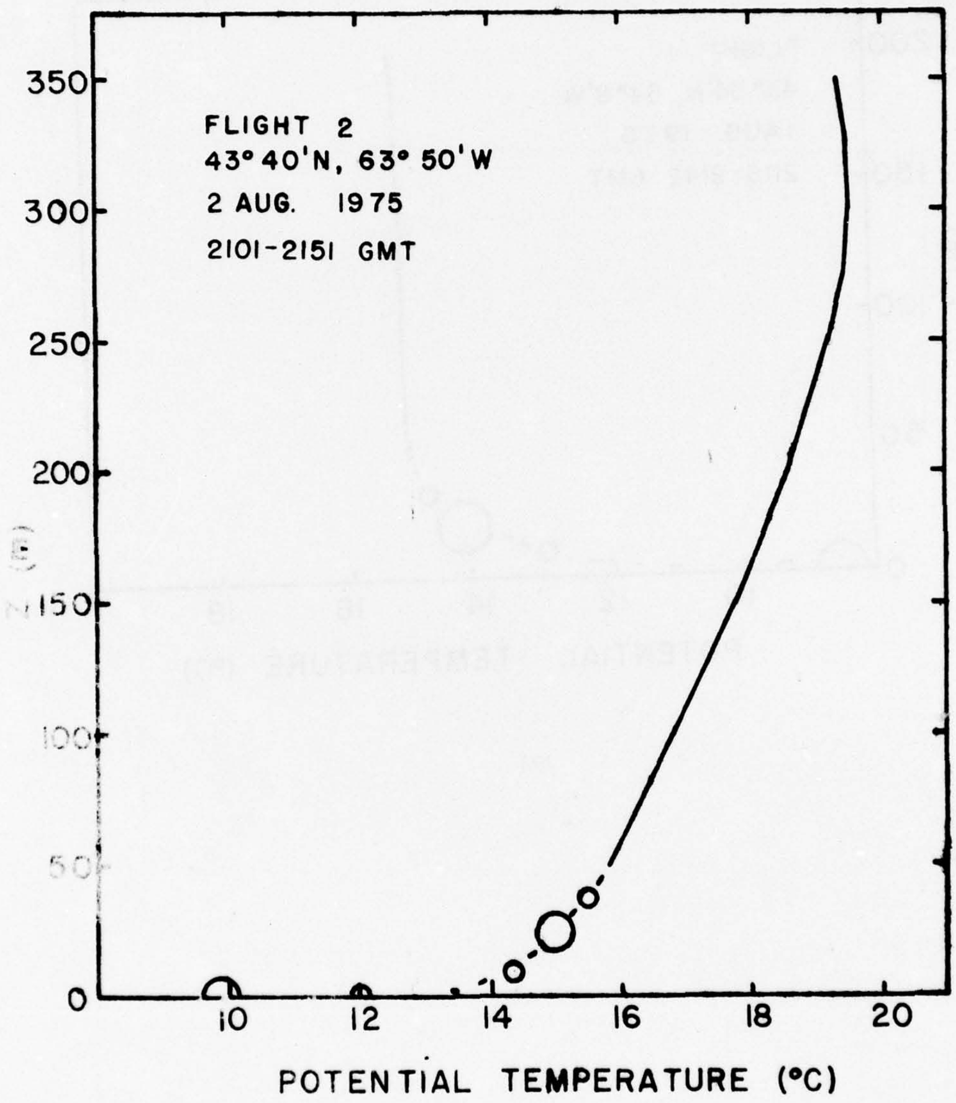
Fig. 27) This profile was made in a low level fog condition in the Irish Sea during flight 33.

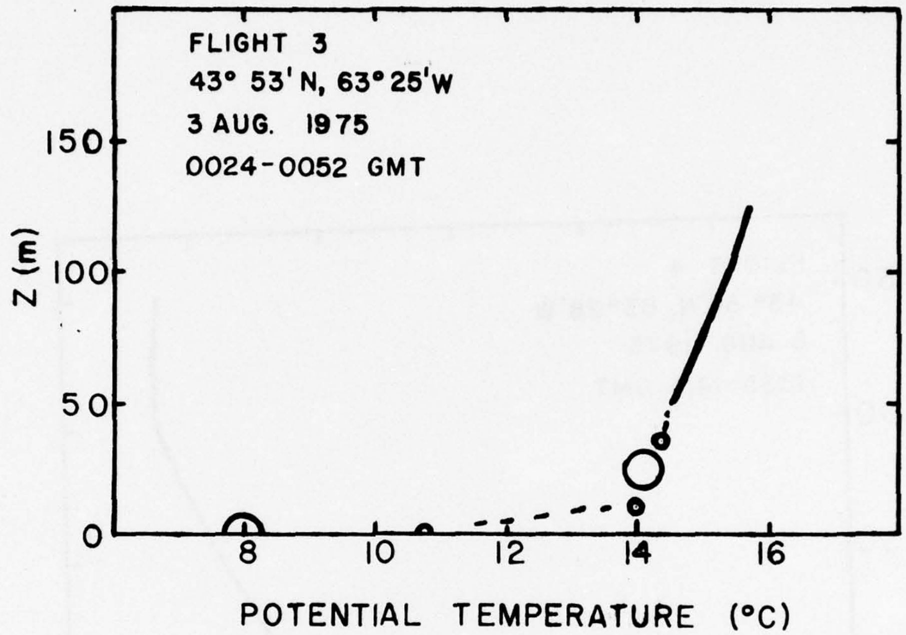
Fig. 28) This figure shows the mixing ratio profiles for flights 16 and 17 which occurred at the conclusion of leg 1 of the cruise. See figures 16 and 17 for the potential temperature data.

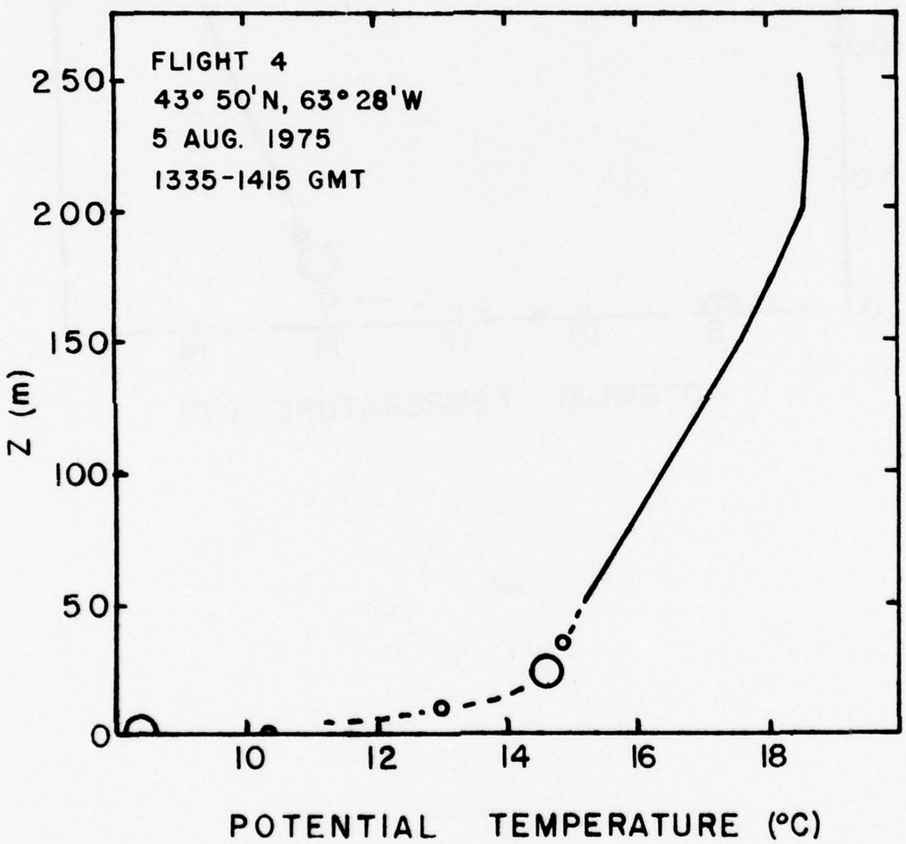
Fig. 29) This figure shows the mixing ratio profiles of flights 18 through 22 in leg 2 of the cruise. This period was generally characterized by a non-foggy condition. See figures 18 through 22 for the potential temperature and other data from these flights.

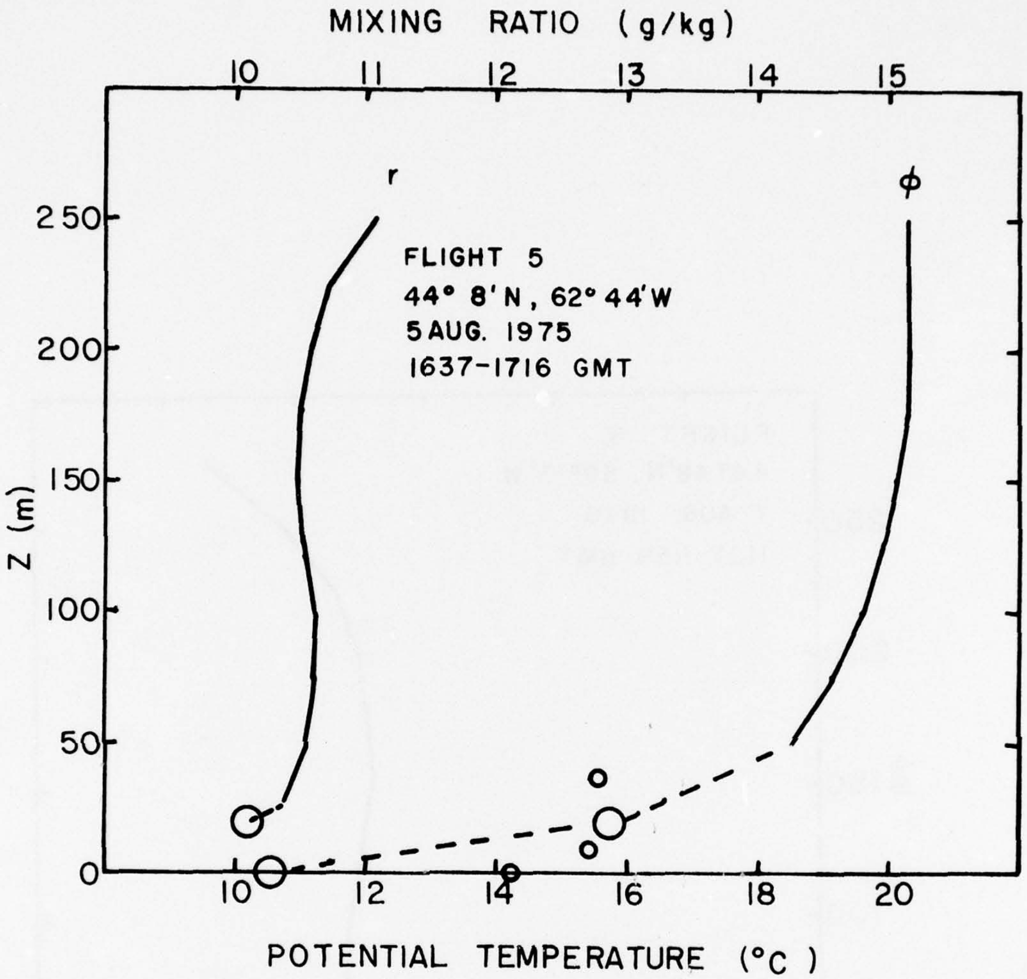
Fig. 30) This figure shows the open ocean and Irish Sea mixing ratio profiles obtained in flights 28, 29, 31, 32, and 33. See figures 23 through 27 for the potential temperature profiles and other data from these flights.

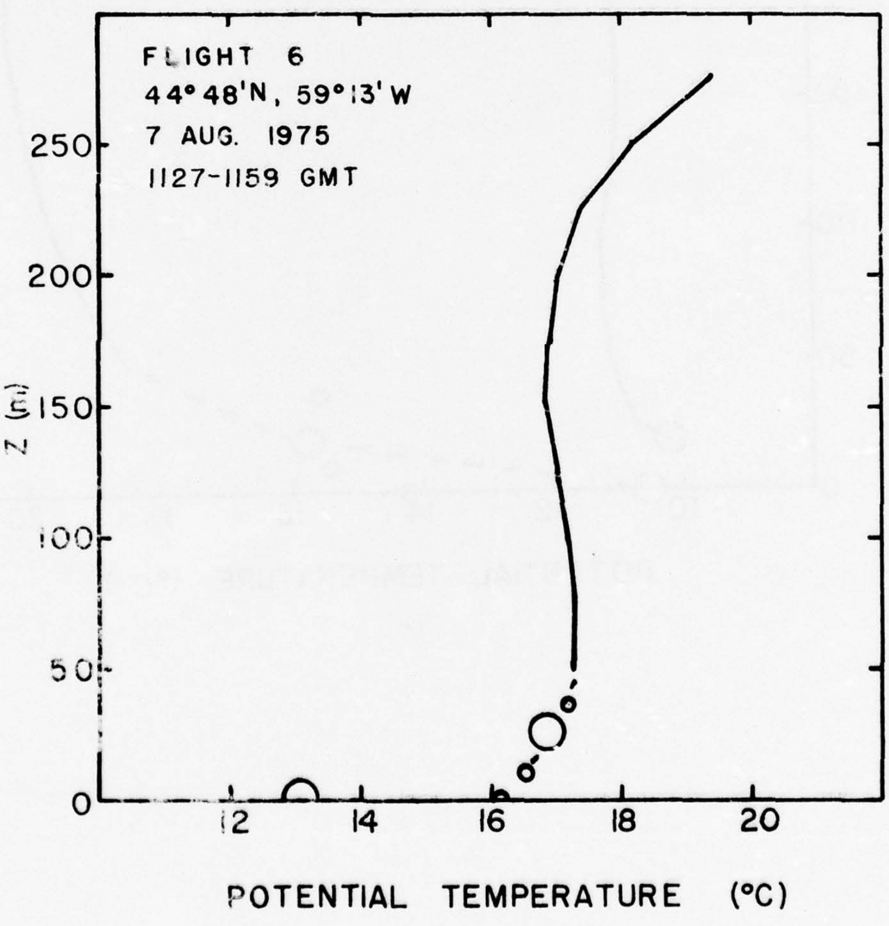

FLIGHT I
43° 34'N, 64° 8'W
1 AUG. 1975
2116-2142 GMT
200
150
100
50
0
Z (m)
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)

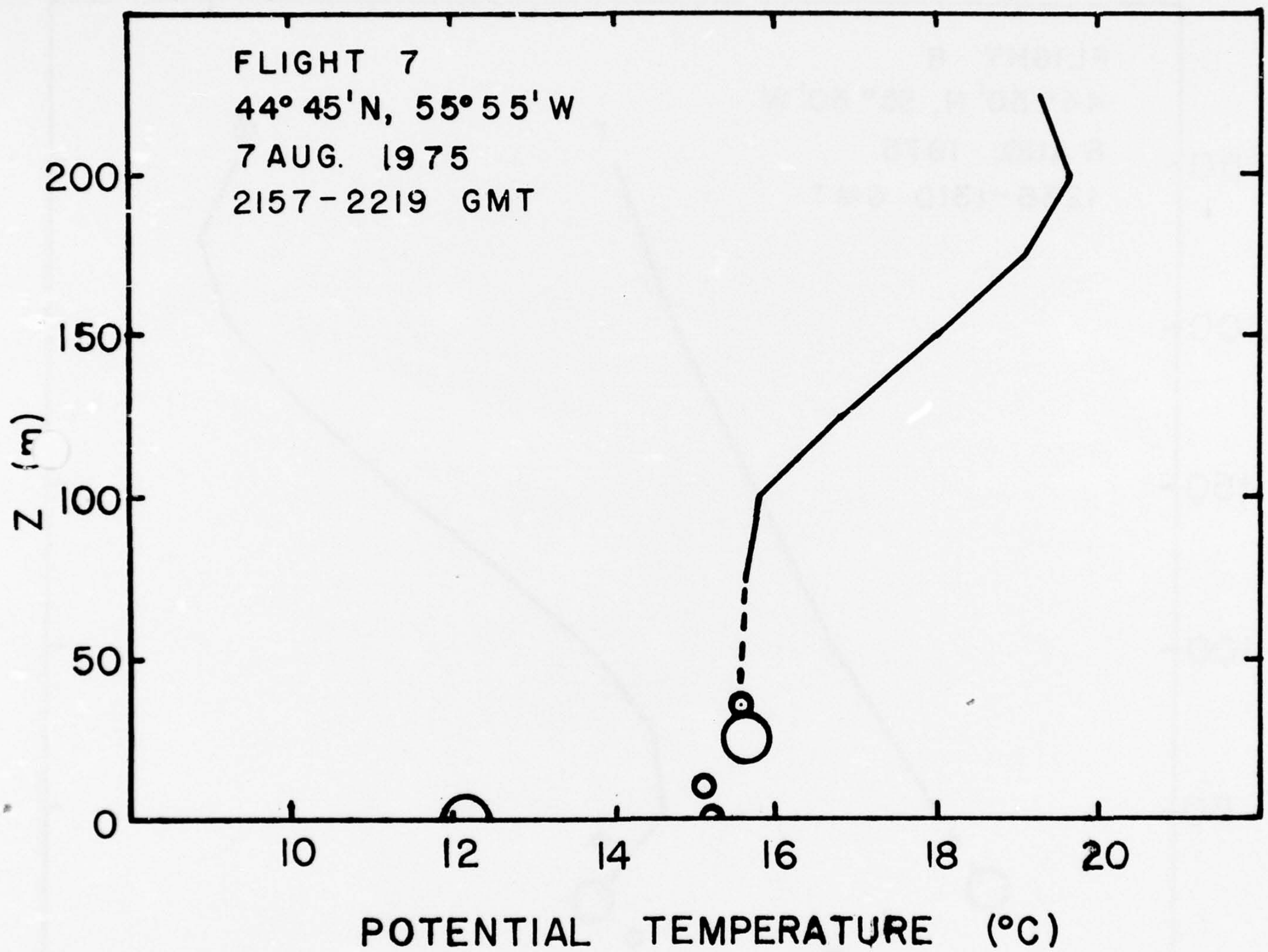

FLIGHT 2
43° 40'N, 63° 50'W
2 AUG. 1975
2101-2151 GMT
350
300
250
200
150
100
50
0
10
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)


FLIGHT 3
43° 53' N, 63° 25' W
3 AUG. 1975
0024-0052 GMT
150
100
50
0
Z (m)
8
10
12
14
16
POTENTIAL TEMPERATURE (°C)

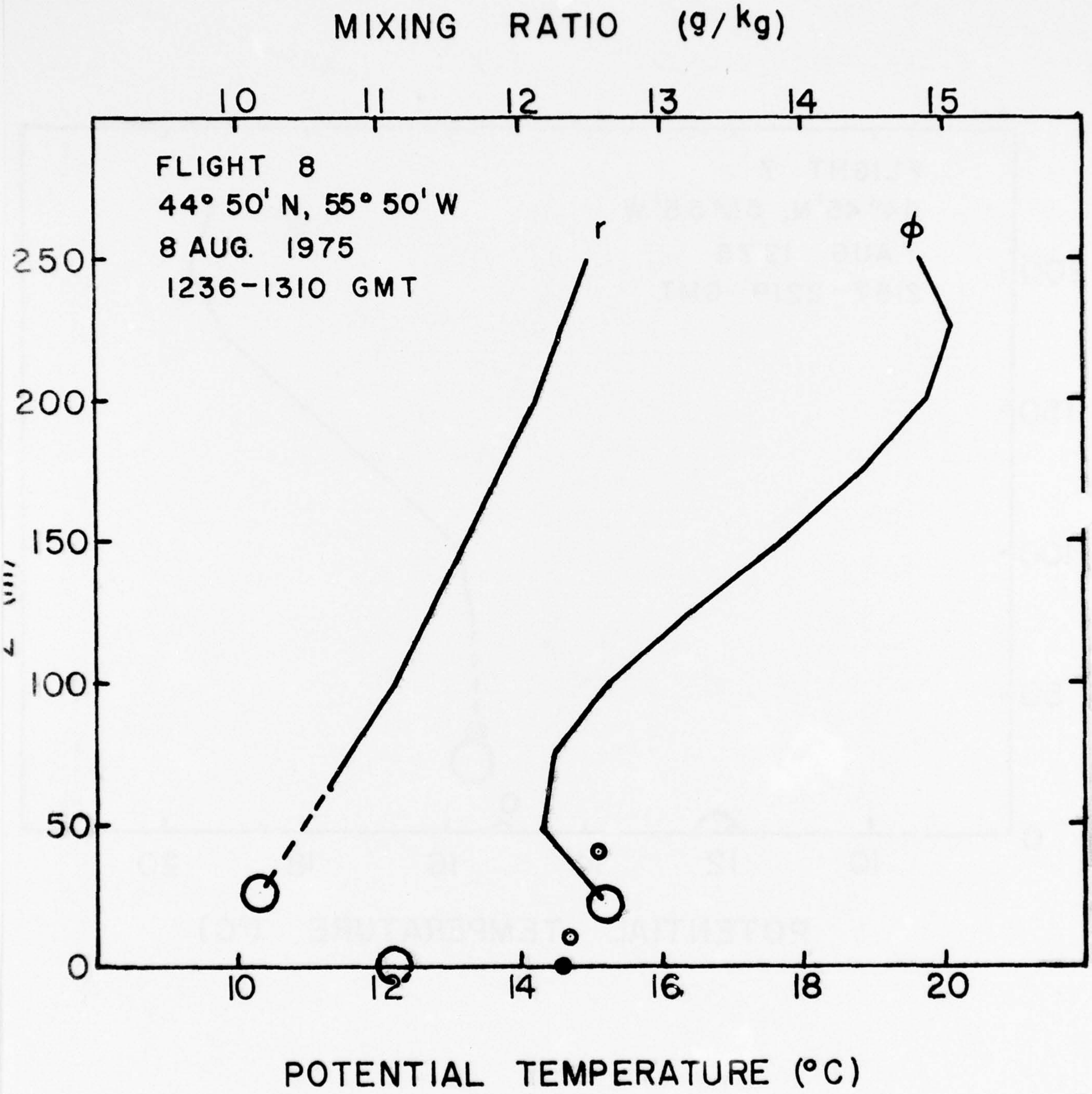

FLIGHT 4
43° 50'N, 63° 28'W
5 AUG. 1975
1335-1415 GMT
250
200
150
100
50
0
Z (m)
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)

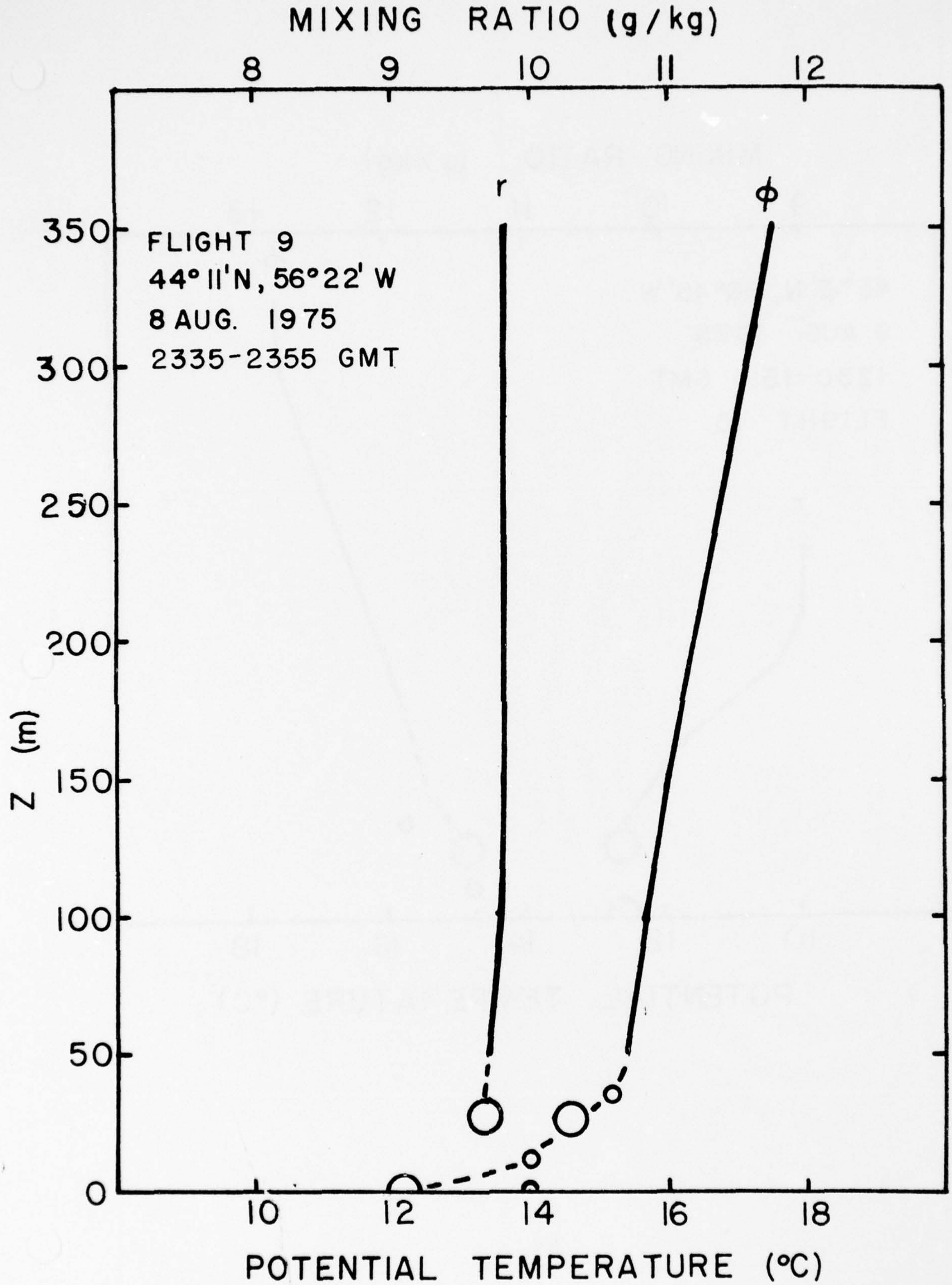

MIXING RATIO (g/kg)
10
11
12
13
14
15
r
φ
FLIGHT 5
44° 8'N, 62° 44'W
5 AUG. 1975
1637-1716 GMT
250
200
150
100
50
0
Z (m)
10
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)


FLIGHT 6
44°48'N, 59°13'W
7 AUG. 1975
1127-1159 GMT
250
200
Z (m)
150
100
50
0
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)

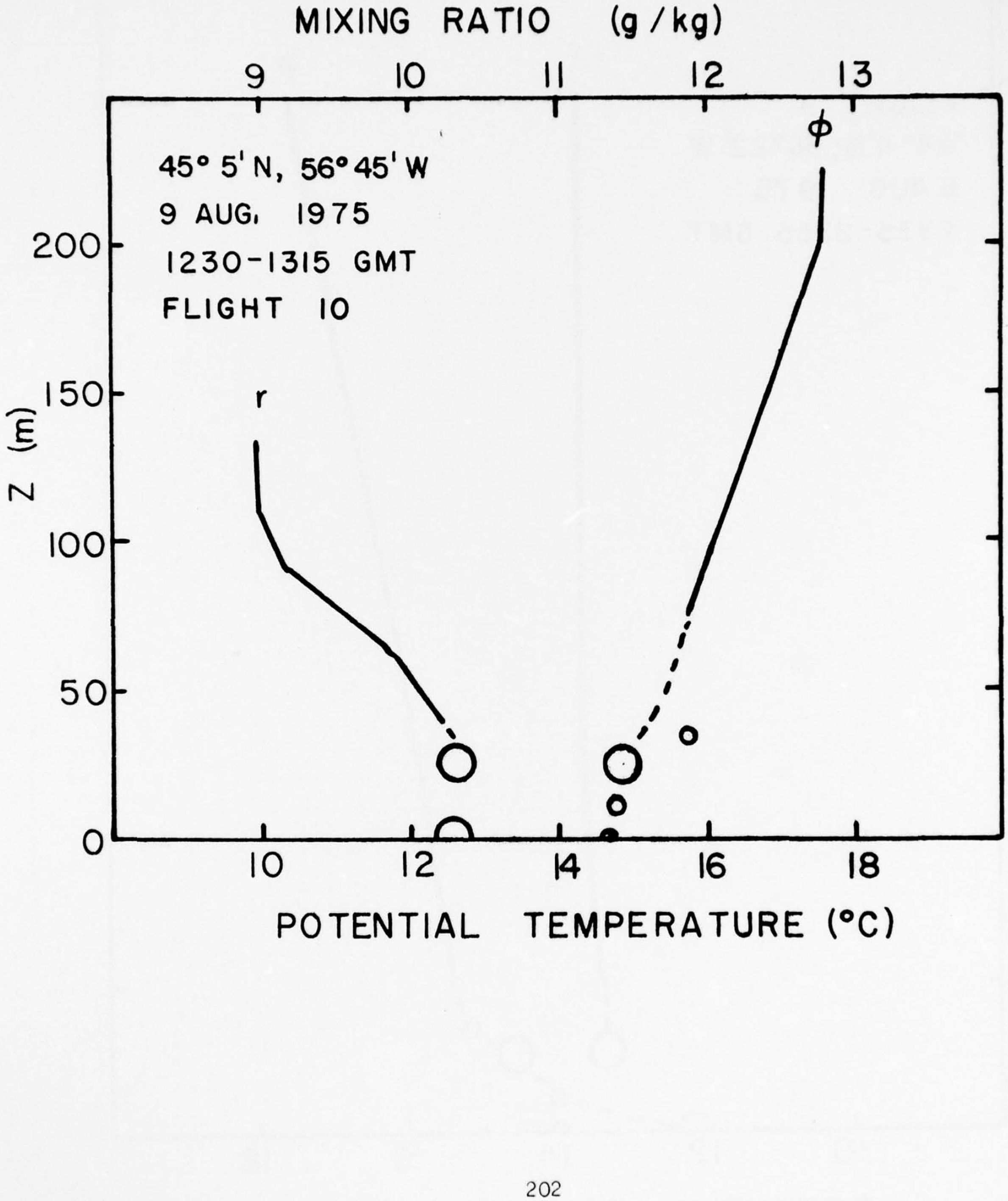


FLIGHT 7
44° 45'N, 55° 55'W
7 AUG. 1975
2157-2219 GMT
Z (m)
0
50
100
150
200
10
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)

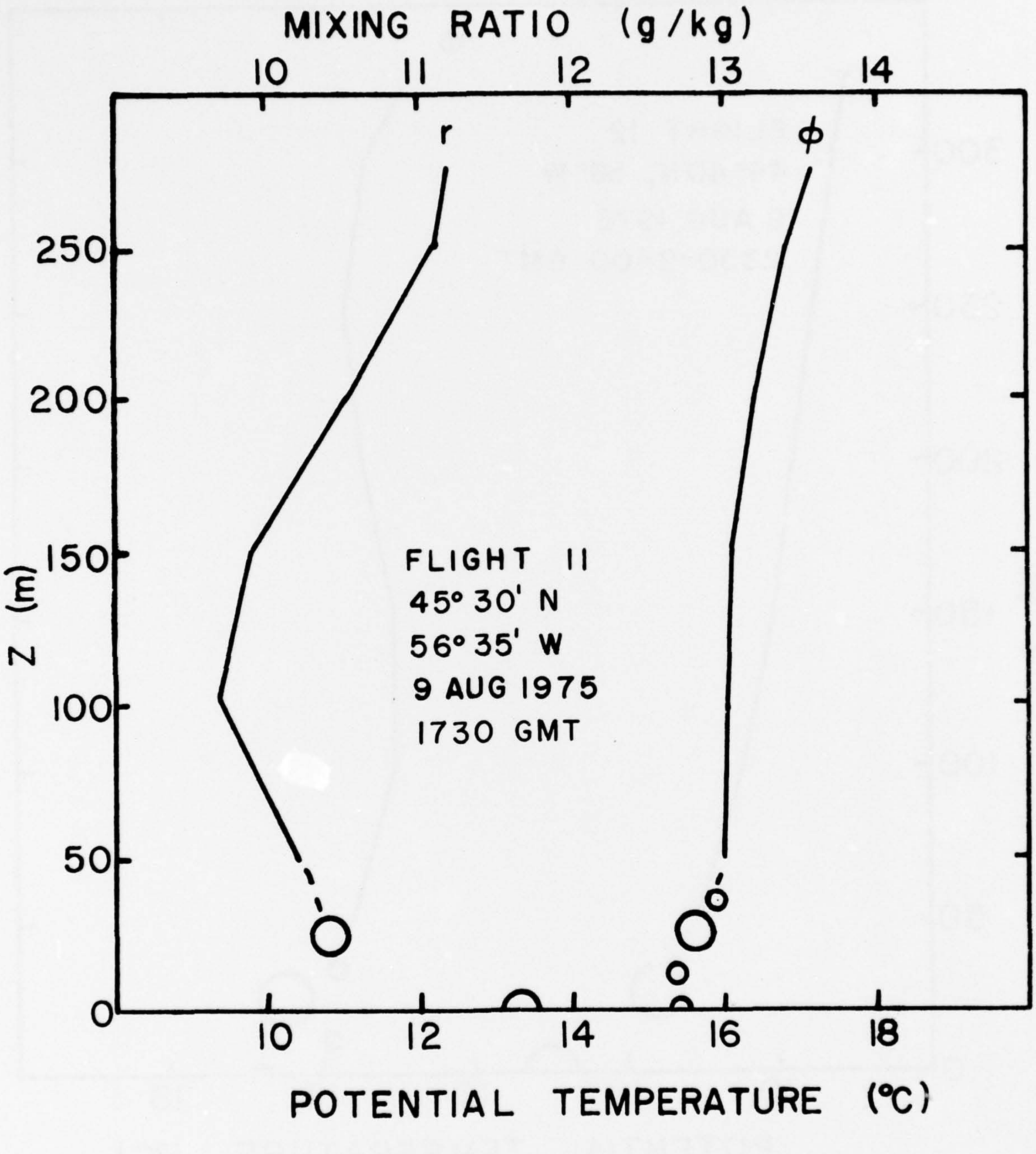

MIXING RATIO (g/kg)
10
11
12
13
14
15
FLIGHT 8
44° 50' N, 55° 50' W
8 AUG. 1975
1236-1310 GMT
r
φ
250
200
150
100
50
0
10
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)

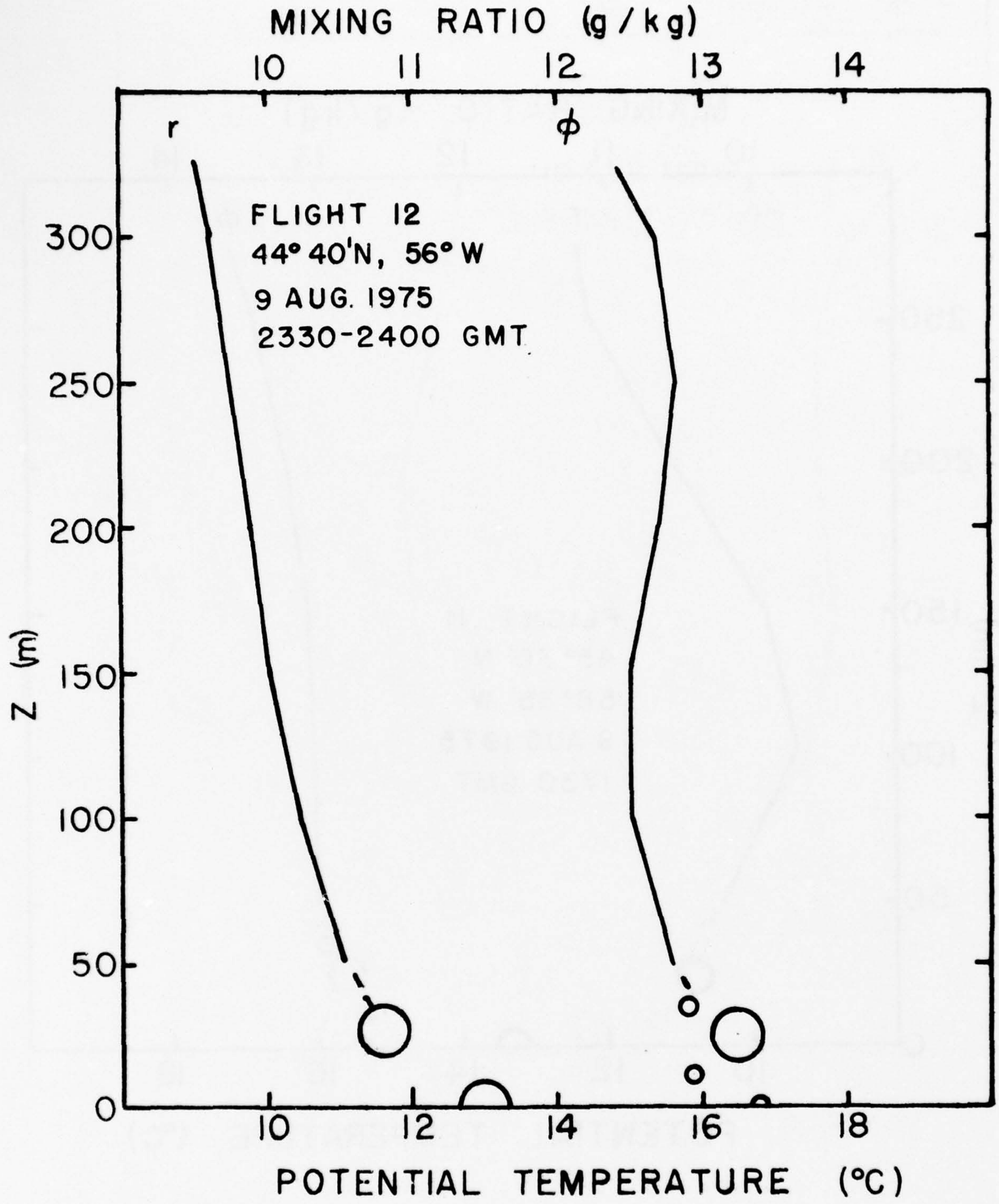


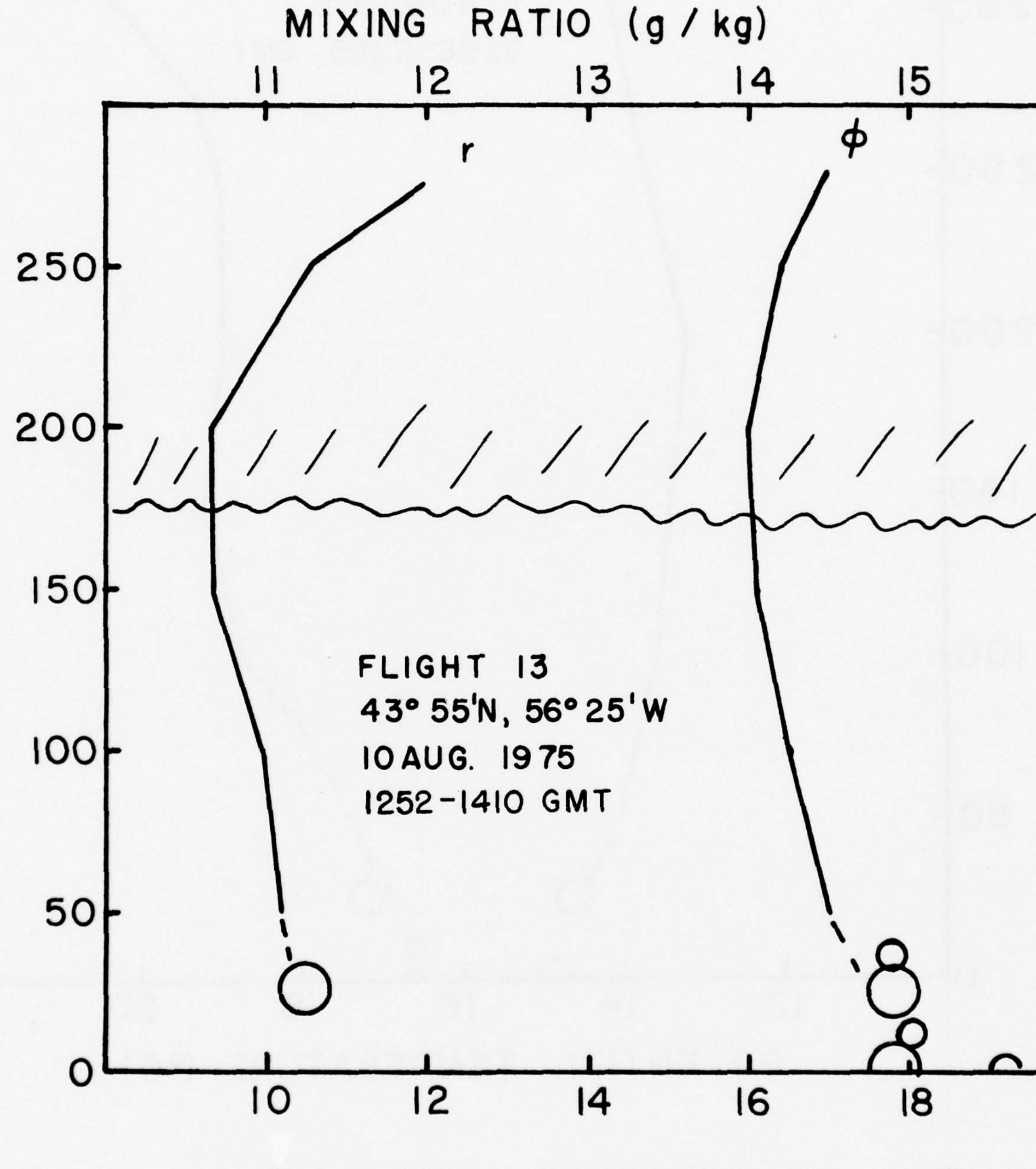
MIXING RATIO (g/kg)
8
9
10
11
12
r
ϕ
FLIGHT 9
44° 11'N, 56°22' W
8 AUG. 1975
2335-2355 GMT
Z (m)
350
300
250
200
150
100
50
0
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)

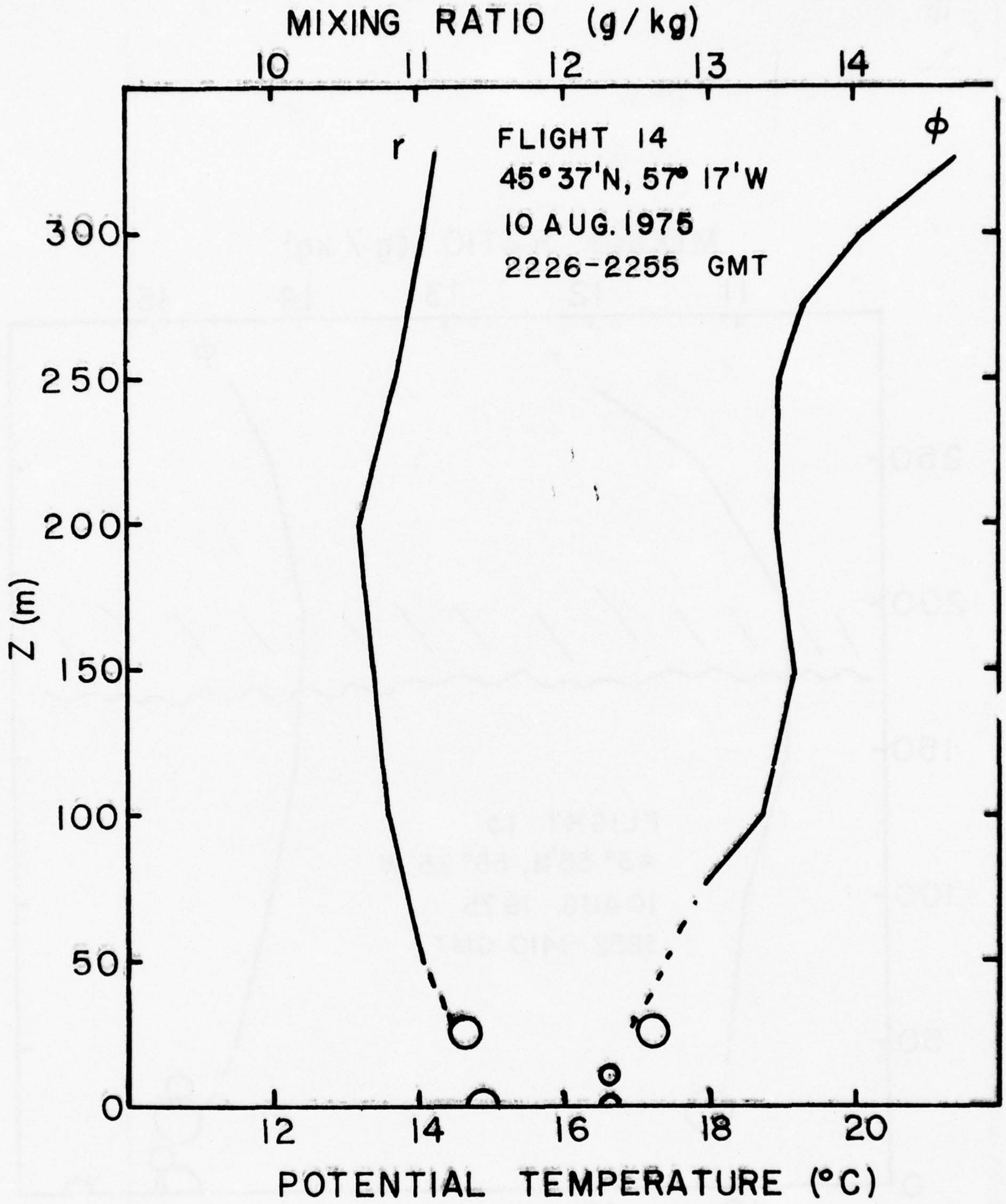


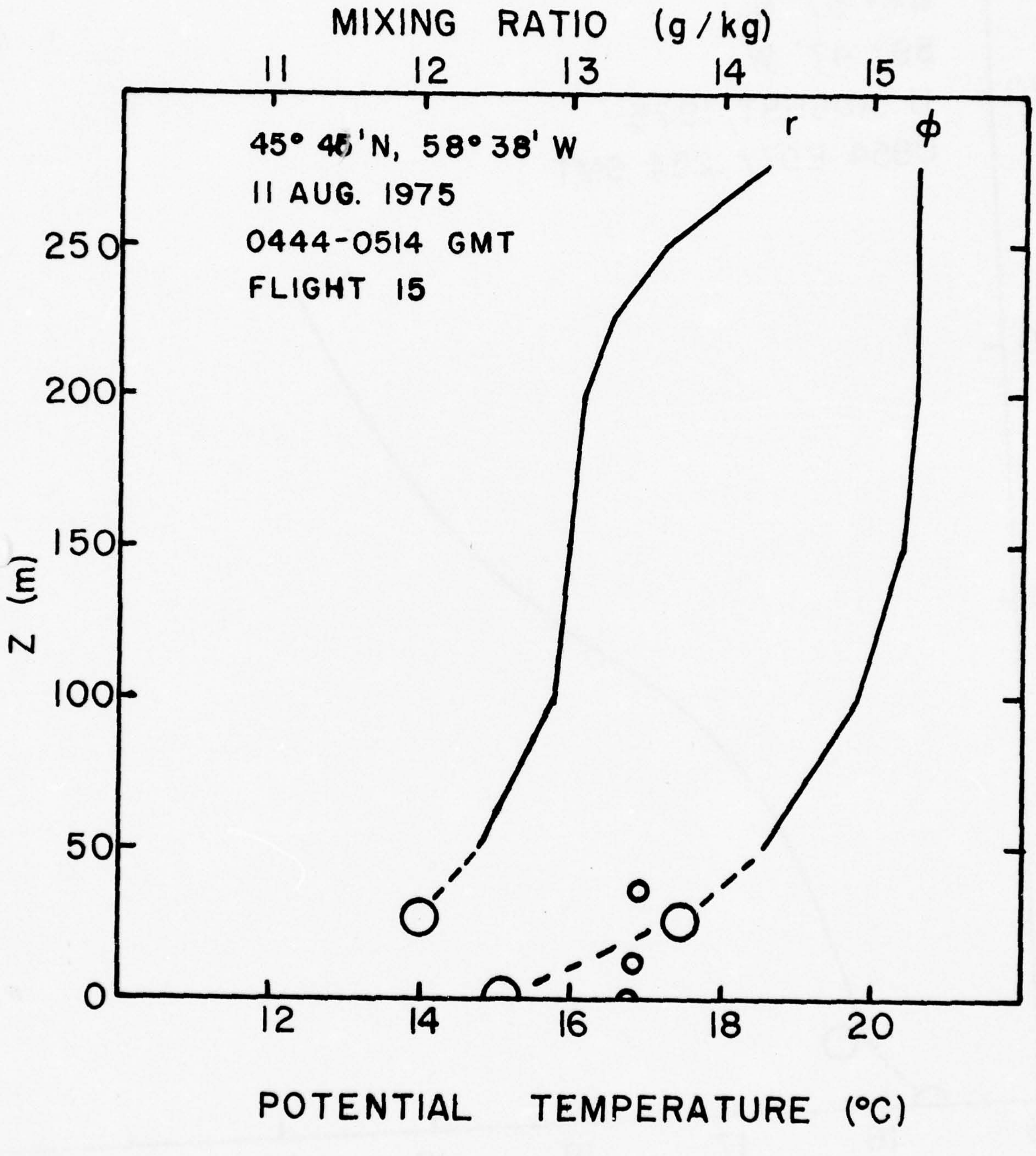
MIXING RATIO (g / kg)
9
10
11
12
13
45° 5' N, 56° 45' W
9 AUG. 1975
1230-1315 GMT
FLIGHT 10
r
φ
Z (m)
200
150
100
50
0
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)


MIXING RATIO (g/kg)
10
11
12
13
14
r
φ
250
200
150
100
50
0
Z (m)
FLIGHT 11
45° 30' N
56° 35' W
9 AUG 1975
1730 GMT
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)

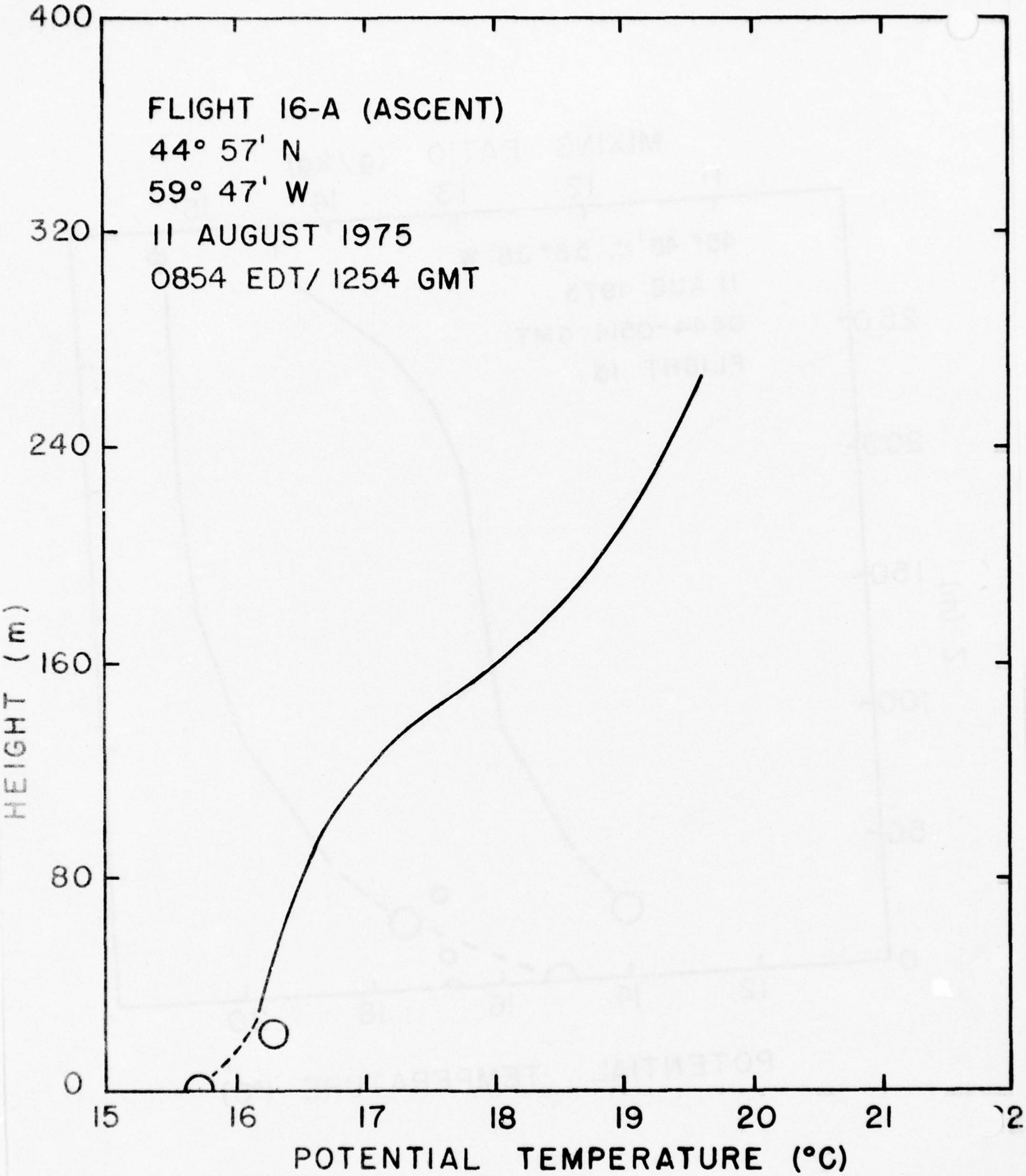

MIXING RATIO (g / kg)
10
11
12
13
14
r
ϕ
FLIGHT 12
44° 40'N, 56° W
9 AUG. 1975
2330-2400 GMT
300
250
200
150
100
50
0
Z (m)
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)

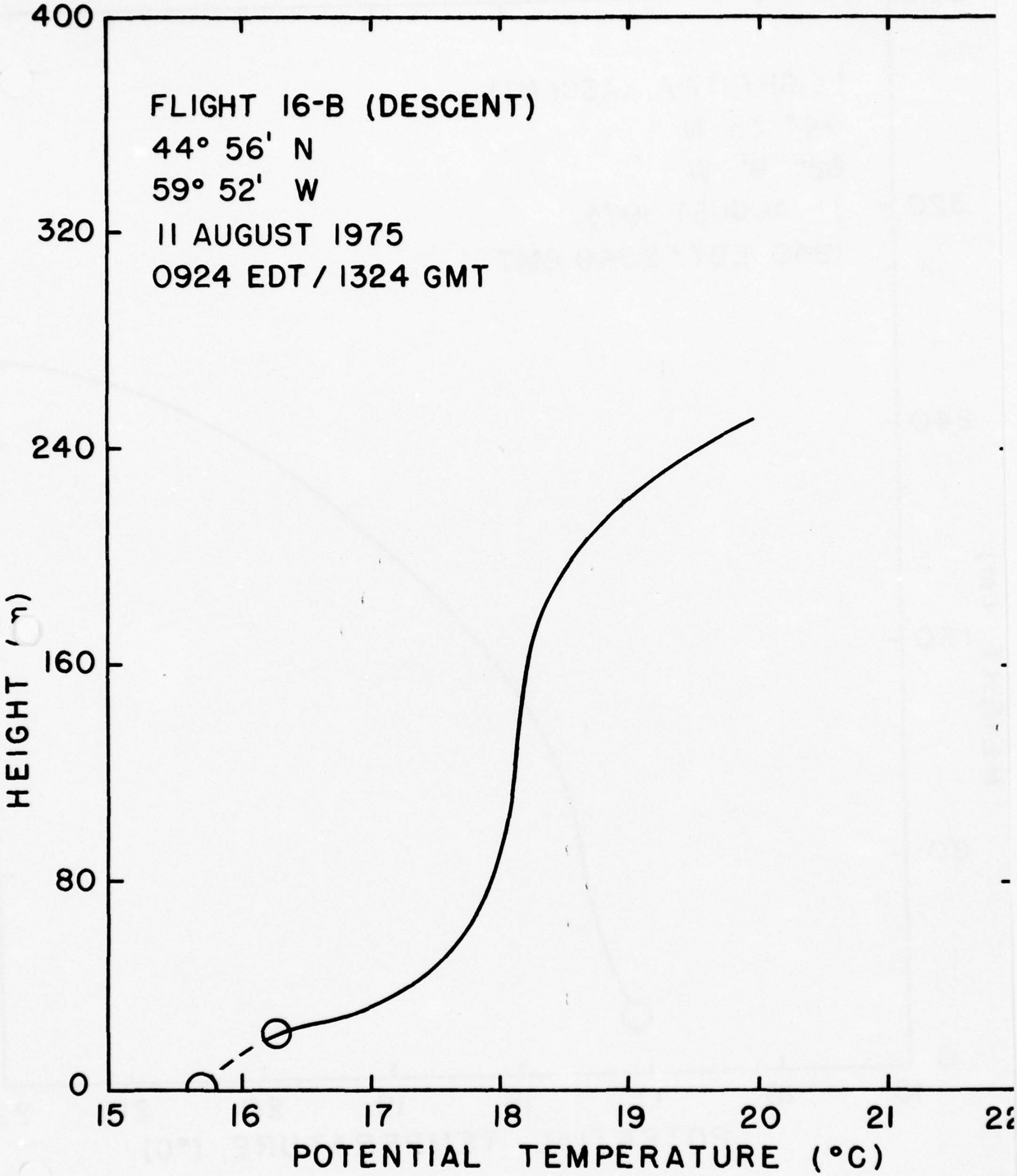

MIXING RATIO (g / kg)
11
12
13
14
15
r
ϕ
250
200
150
100
50
0
FLIGHT 13
43° 55'N, 56° 25'W
10 AUG. 1975
1252-1410 GMT
10
12
14
16
18
POTENTIAL TEMPERATURE (°C)


MIXING RATIO (g/kg)
10
11
12
13
14
r
FLIGHT 14
45° 37'N, 57° 17'W
10 AUG. 1975
2226-2255 GMT
ϕ
300
250
200
150
100
50
0
Z (m)
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)

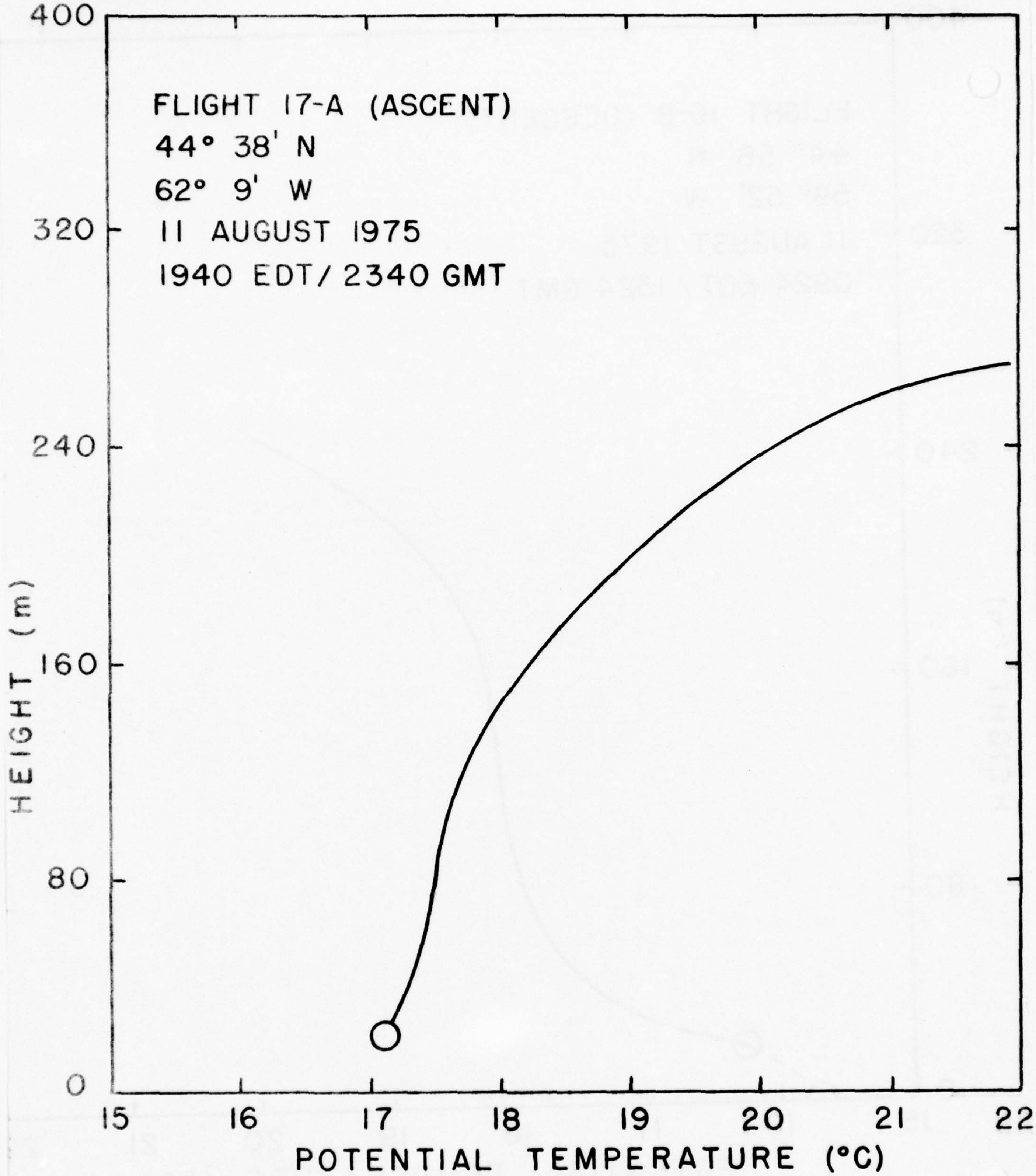


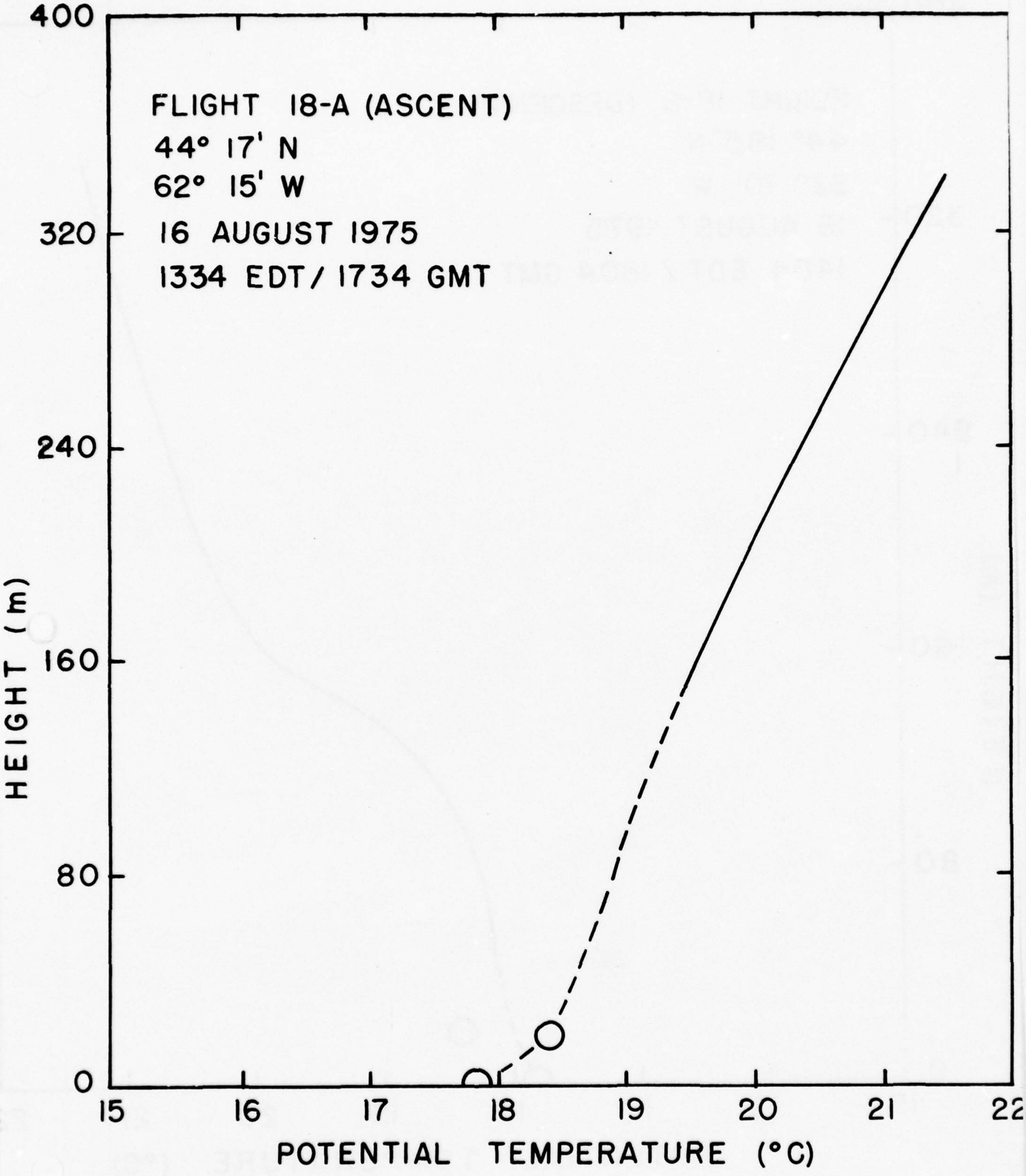
MIXING RATIO (g/kg)
11
12
13
14
15
r
ϕ
45° 45'N, 58° 38' W
11 AUG. 1975
0444-0514 GMT
FLIGHT 15
250
200
150
100
50
0
Z (m)
12
14
16
18
20
POTENTIAL TEMPERATURE (°C)

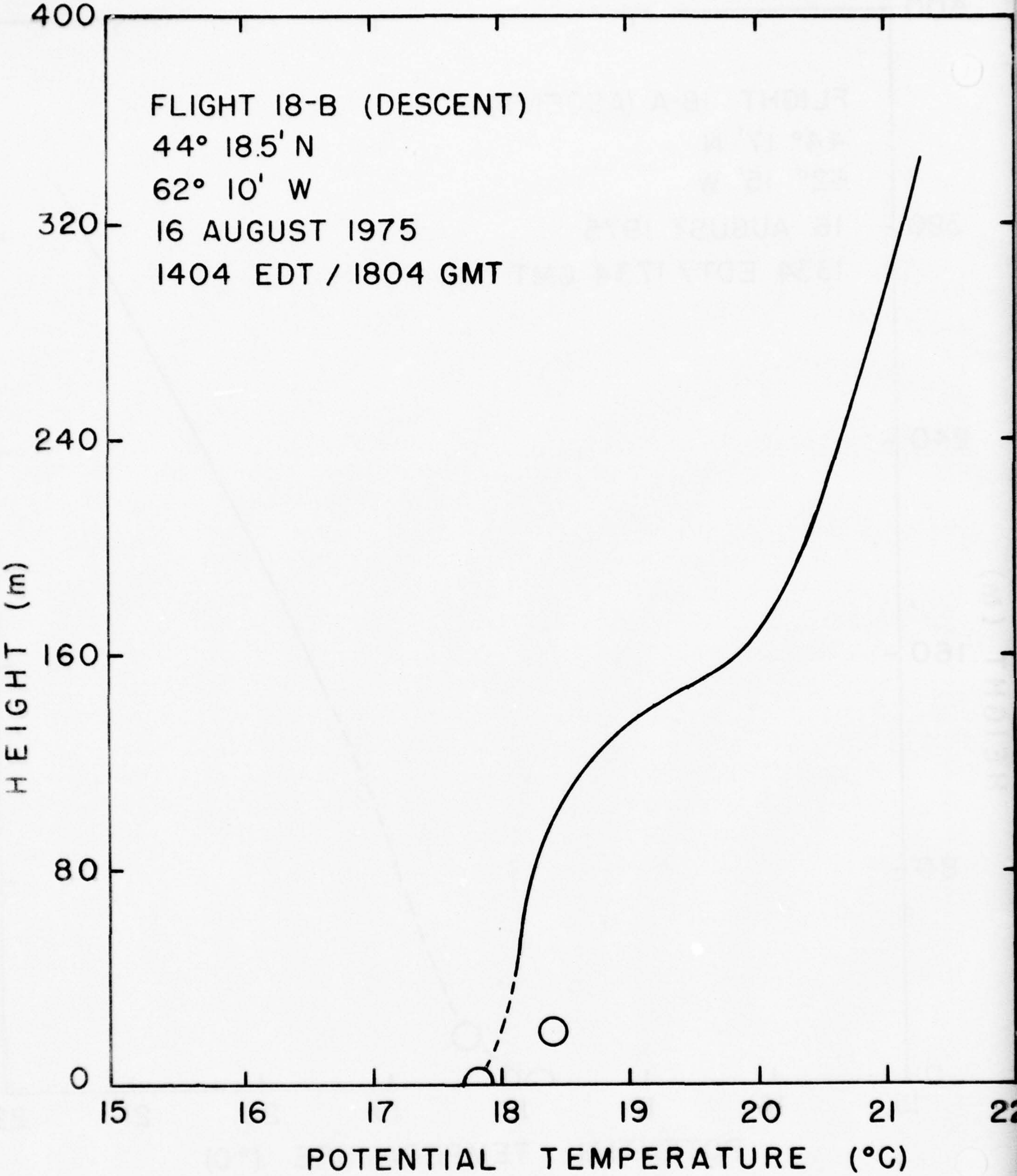

FLIGHT 16-A (ASCENT)
44° 57' N
59° 47' W
11 AUGUST 1975
0854 EDT/ 1254 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

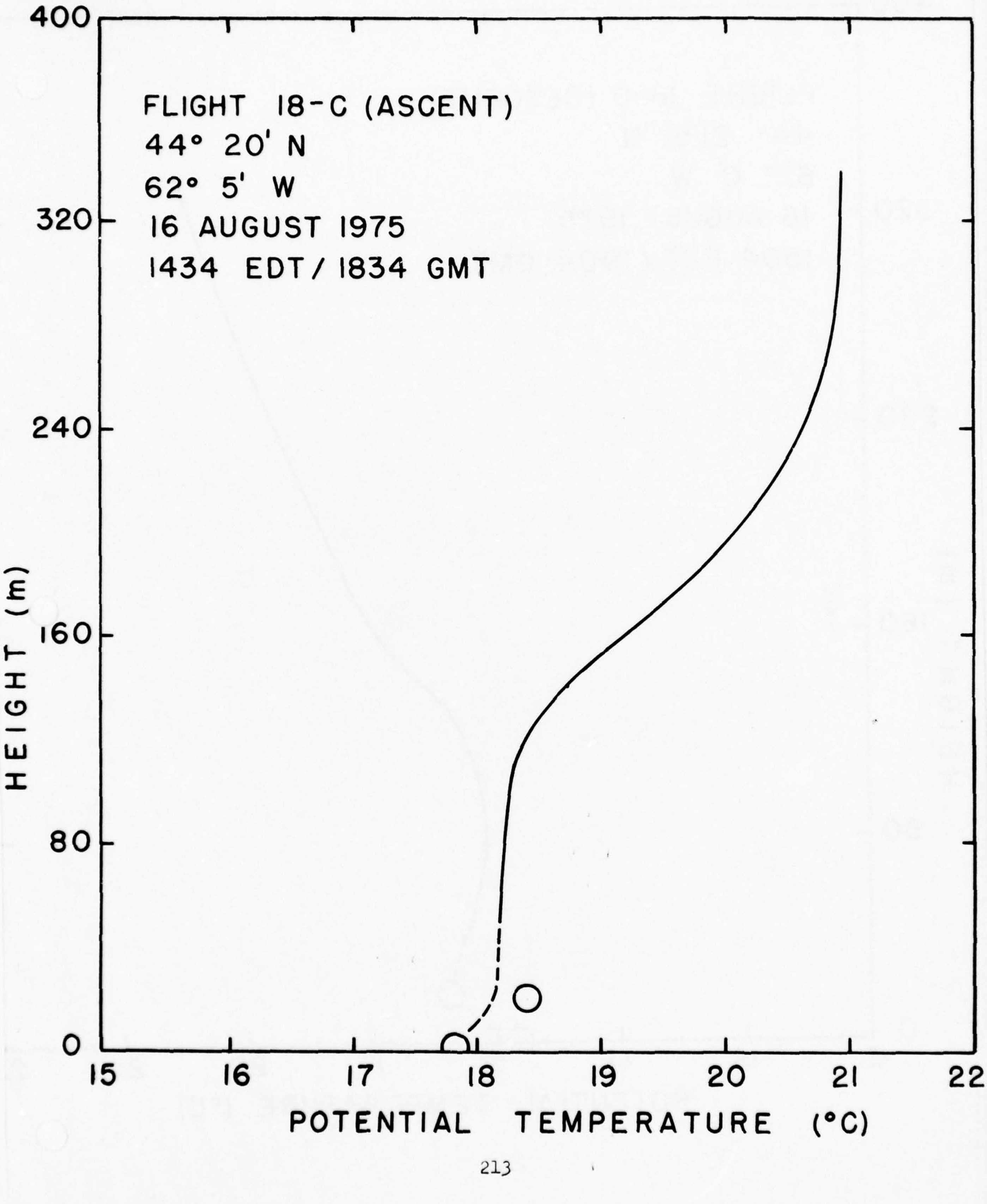


FLIGHT 16-B (DESCENT)
44° 56' N
59° 52' W
11 AUGUST 1975
0924 EDT / 1324 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

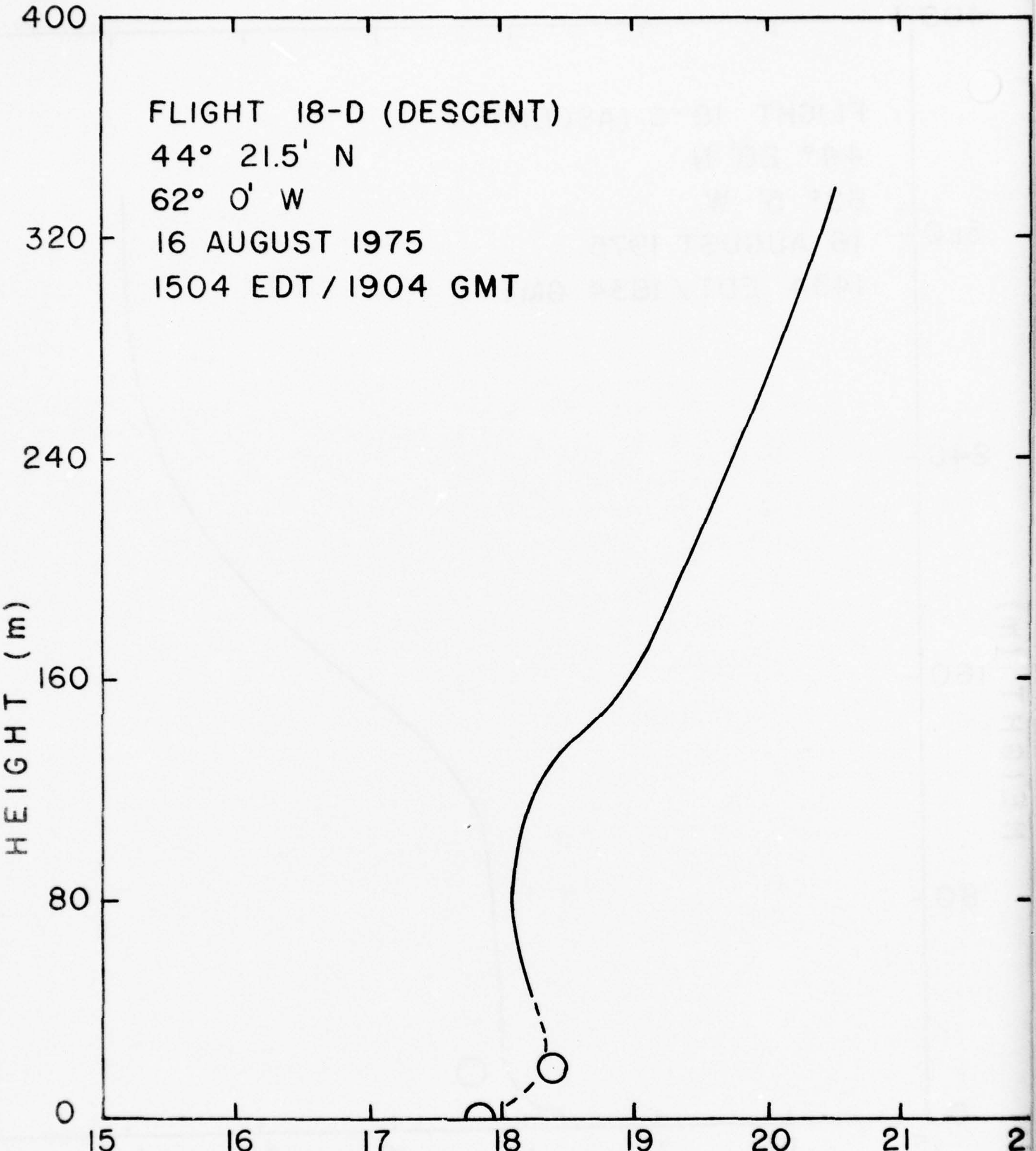

FLIGHT 17-A (ASCENT)
44° 38' N
62° 9' W
11 AUGUST 1975
1940 EDT/ 2340 GMT
HEIGHT (m)
0
80
160
240
320
400
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)


FLIGHT 18-A (ASCENT)
44° 17' N
62° 15' W
16 AUGUST 1975
1334 EDT/1734 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

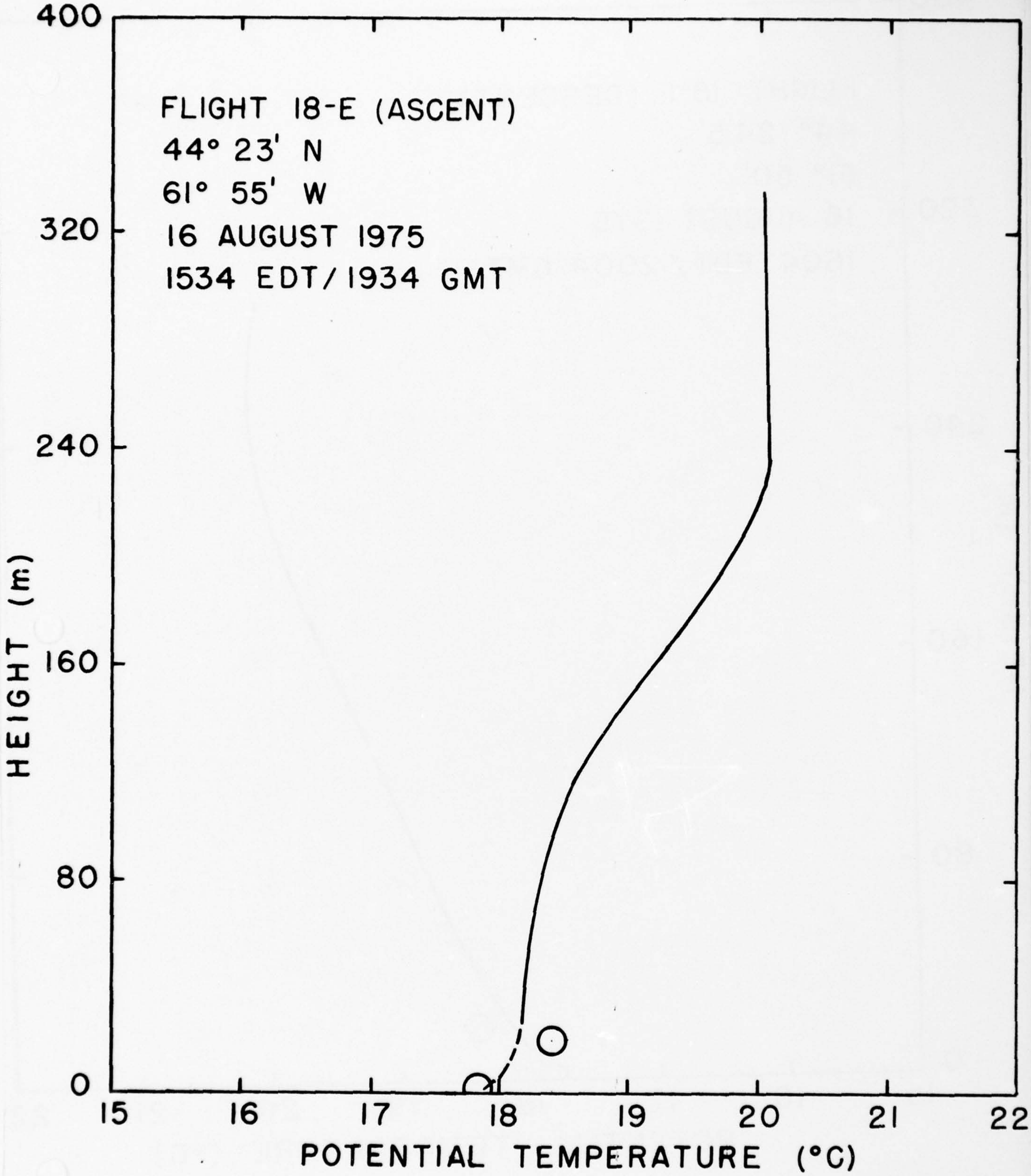

FLIGHT 18-B (DESCENT)
44° 18.5' N
62° 10' W
16 AUGUST 1975
1404 EDT / 1804 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

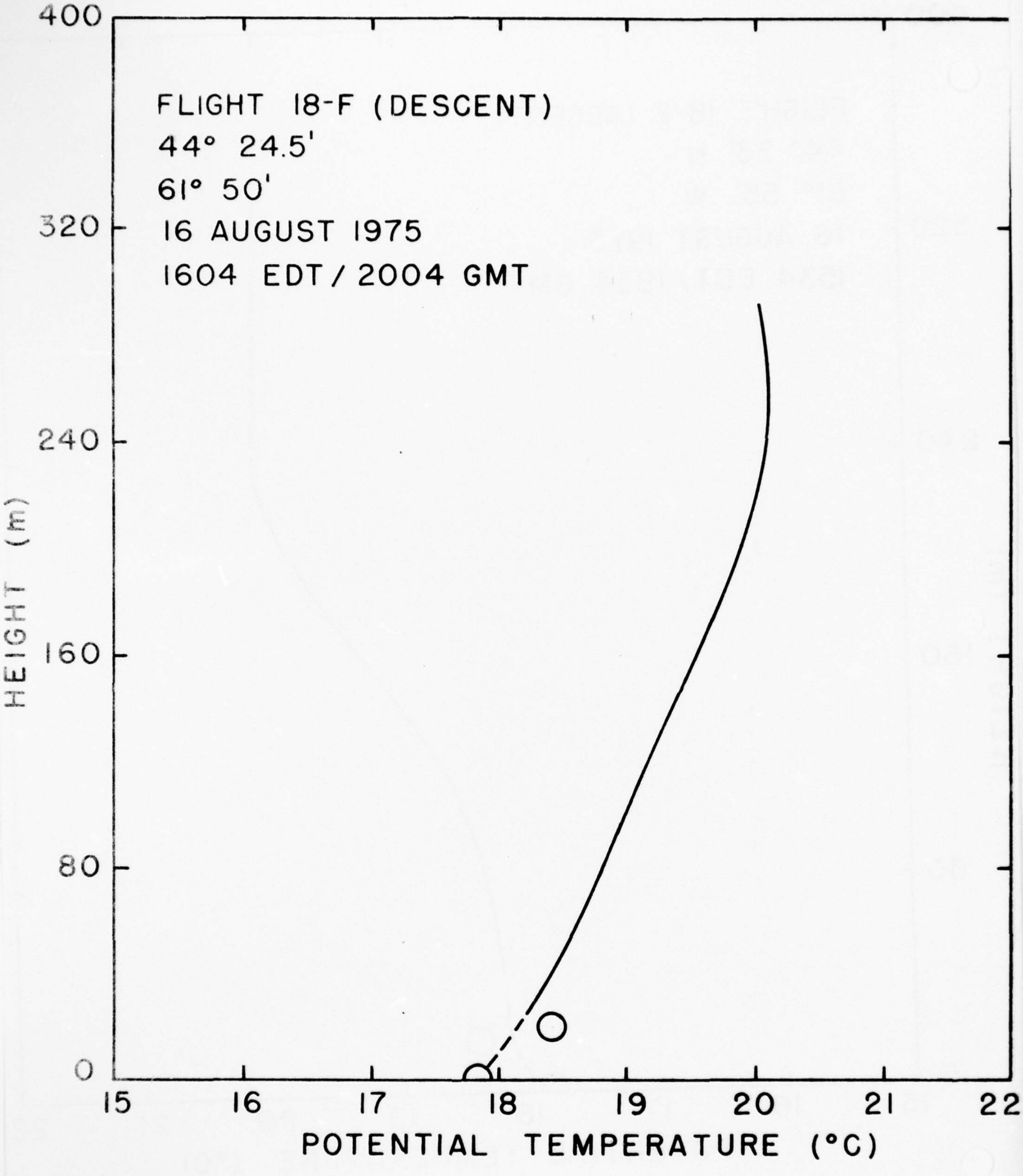


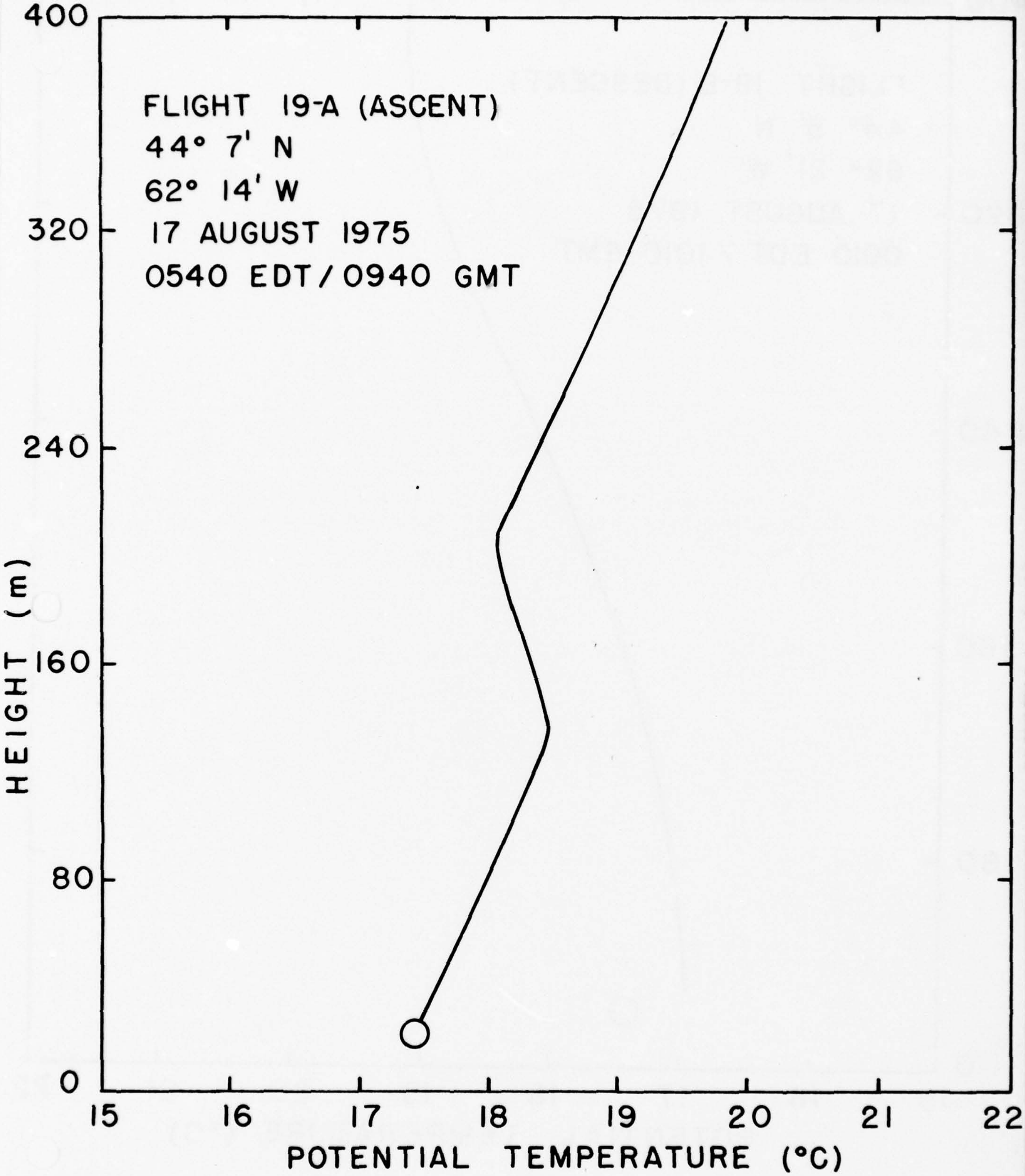
FLIGHT 18-C (ASCENT)
44° 20' N
62° 5' W
16 AUGUST 1975
1434 EDT/ 1834 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

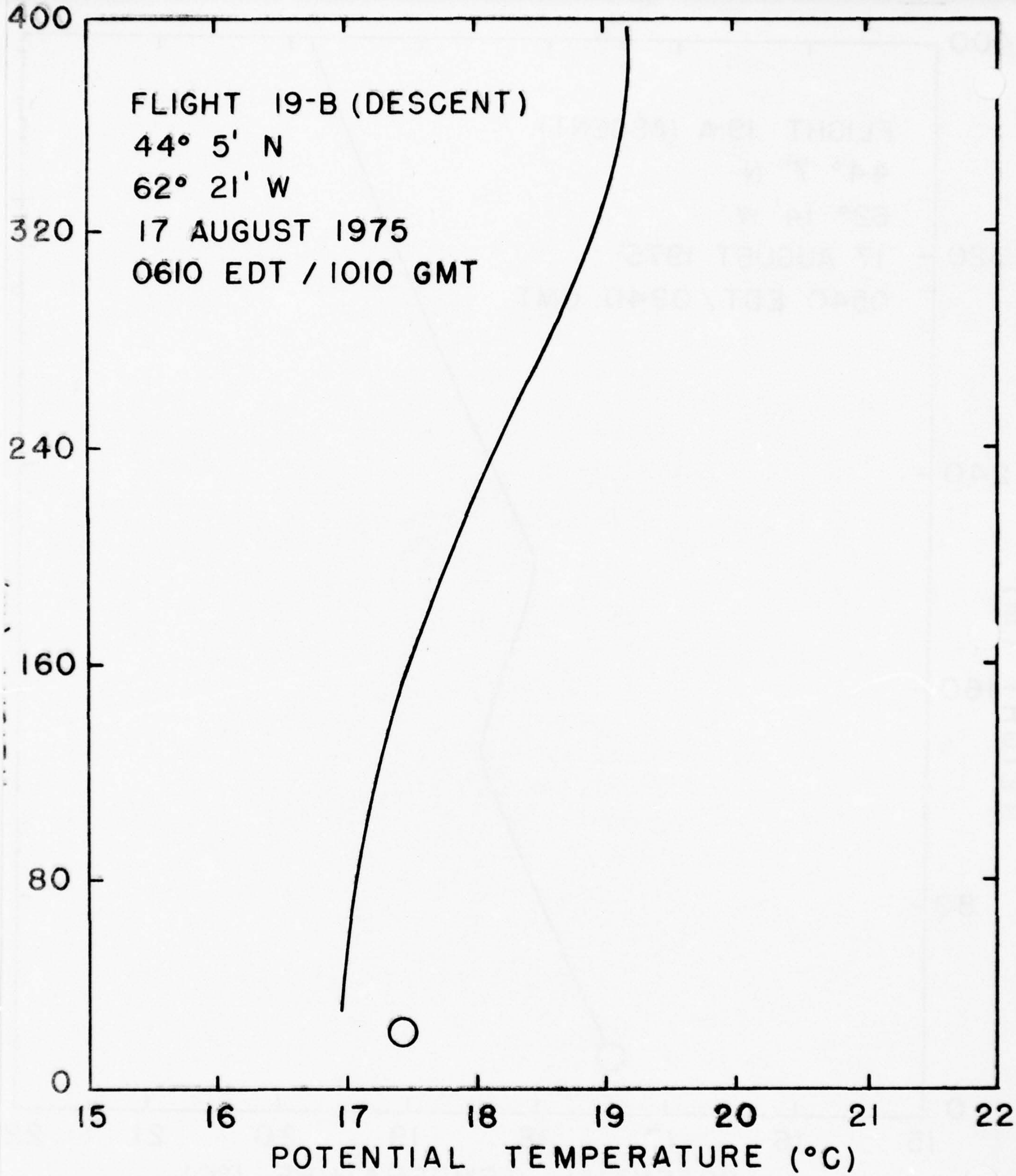


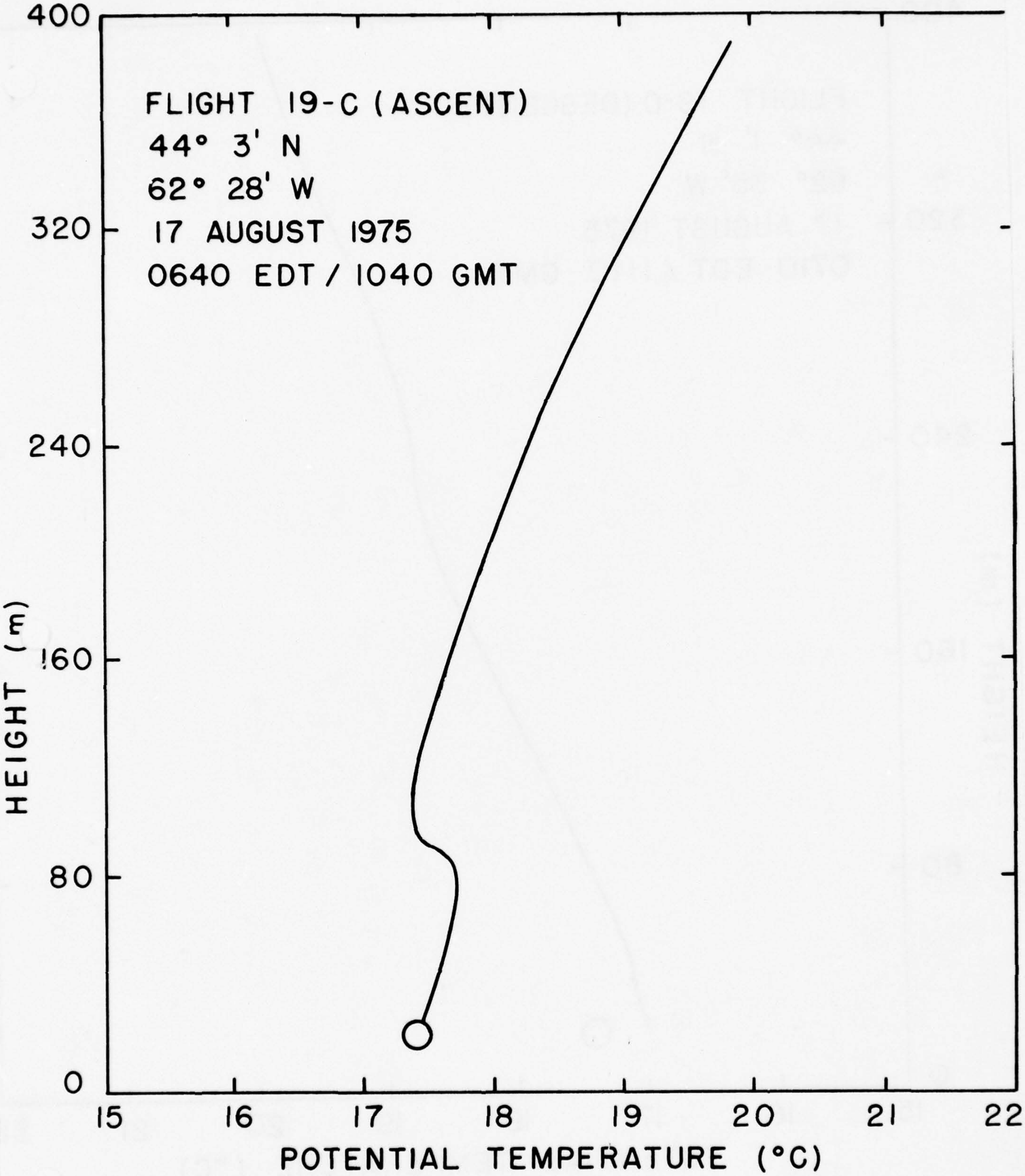
400
320
240
160
80
0
HEIGHT (m)
FLIGHT 18-D (DESCENT)
44° 21.5' N
62° 0' W
16 AUGUST 1975
1504 EDT/1904 GMT
15
16
17
18
19
20
21
2
POTENTIAL TEMPERATURE (°C)

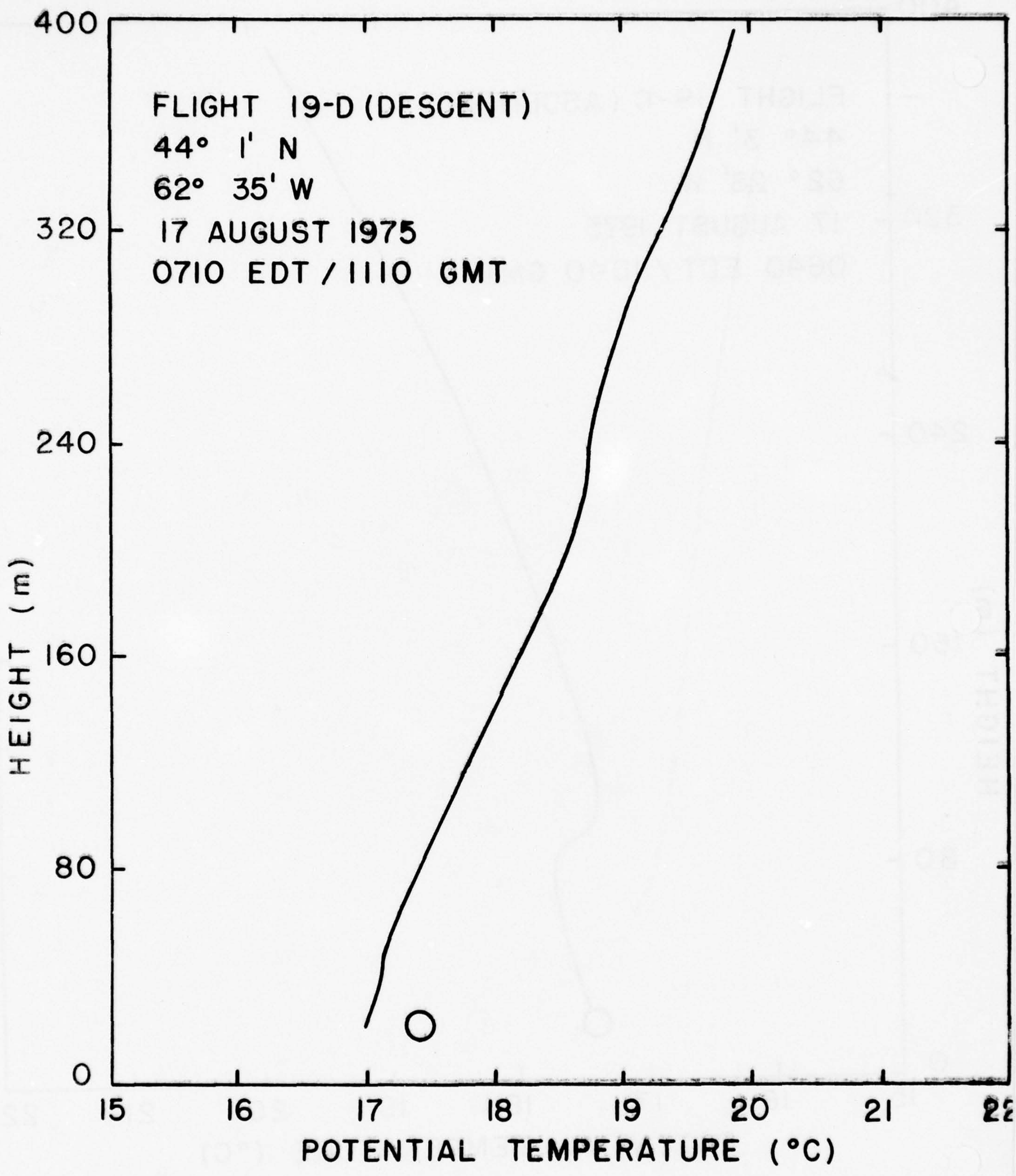

FLIGHT 18-E (ASCENT)
44° 23' N
61° 55' W
16 AUGUST 1975
1534 EDT/1934 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

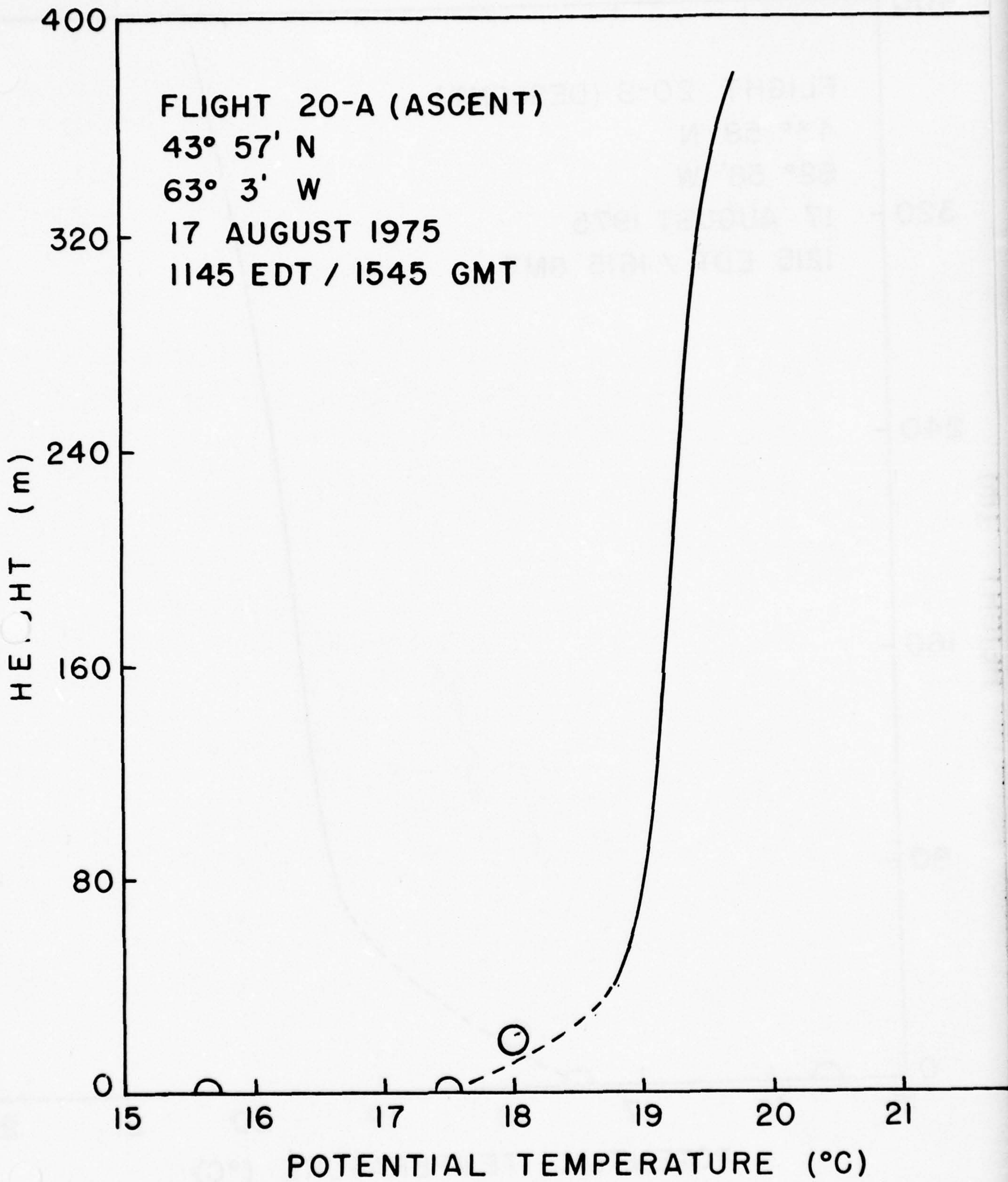

FLIGHT 18-F (DESCENT)
44° 24.5'
61° 50'
16 AUGUST 1975
1604 EDT / 2004 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

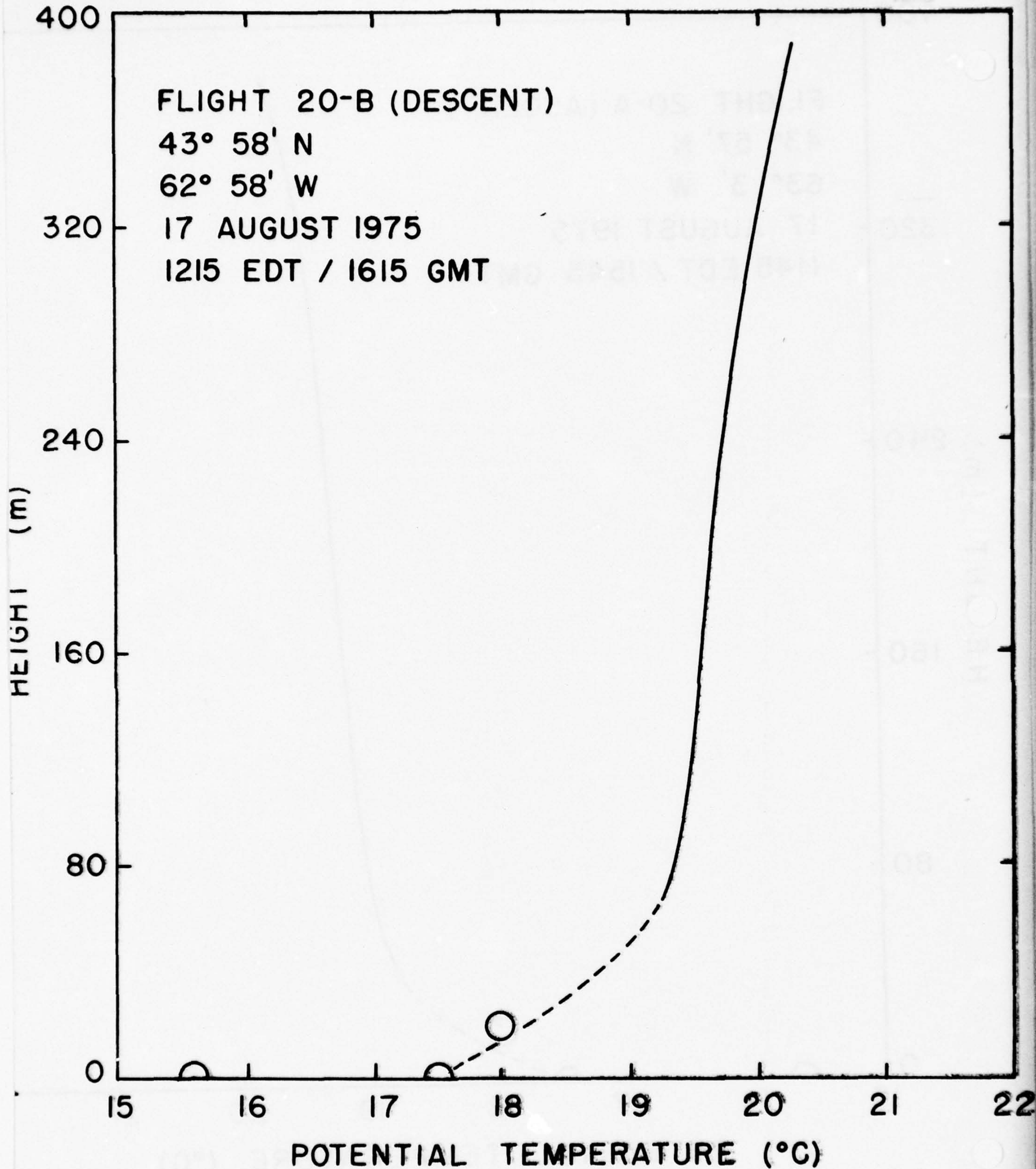

FLIGHT 19-A (ASCENT)
44° 7' N
62° 14' W
17 AUGUST 1975
0540 EDT / 0940 GMT
HEIGHT (m)
0
80
160
240
320
400
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

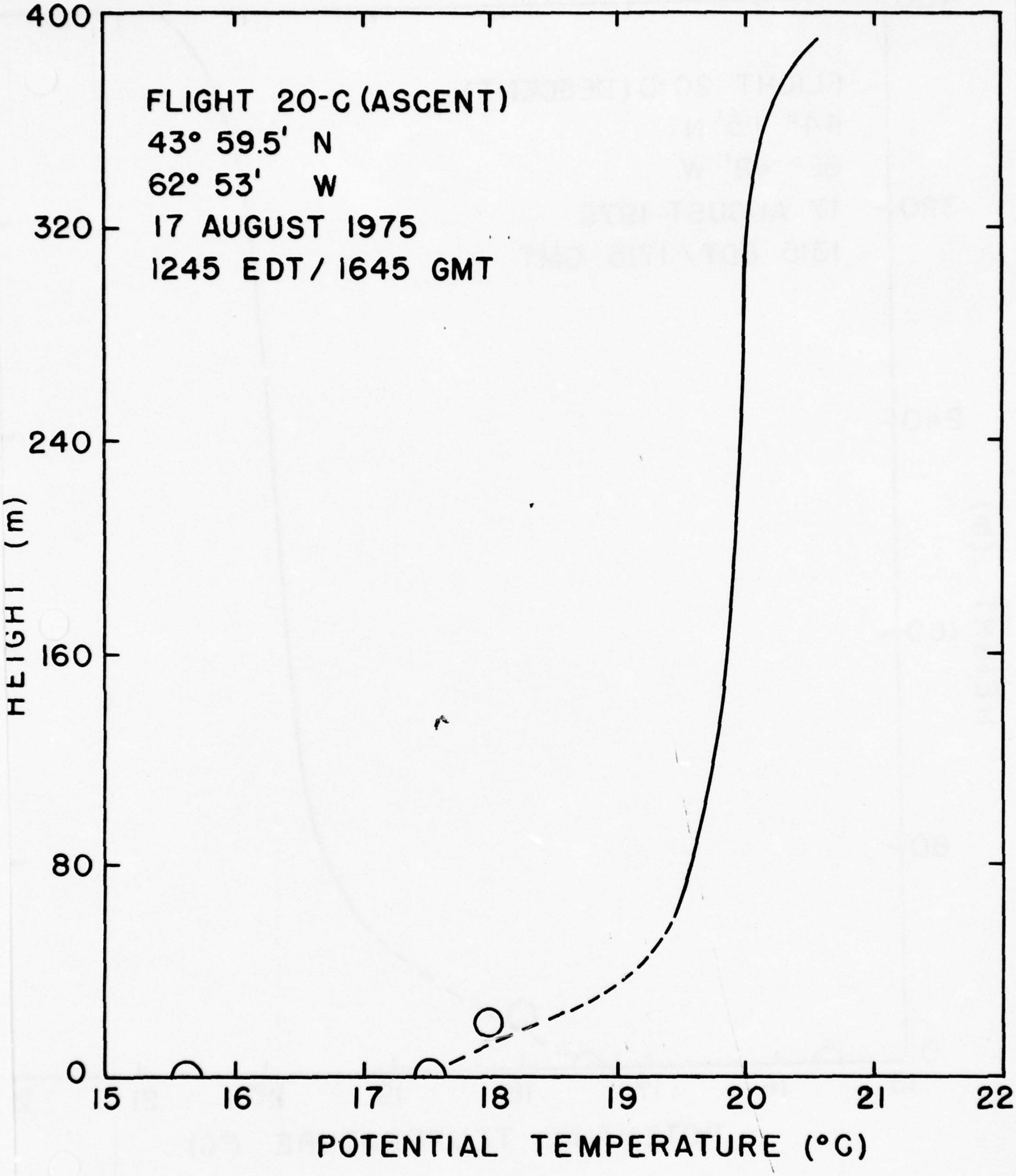

FLIGHT 19-B (DESCENT)
44° 5' N
62° 21' W
17 AUGUST 1975
0610 EDT / 1010 GMT
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

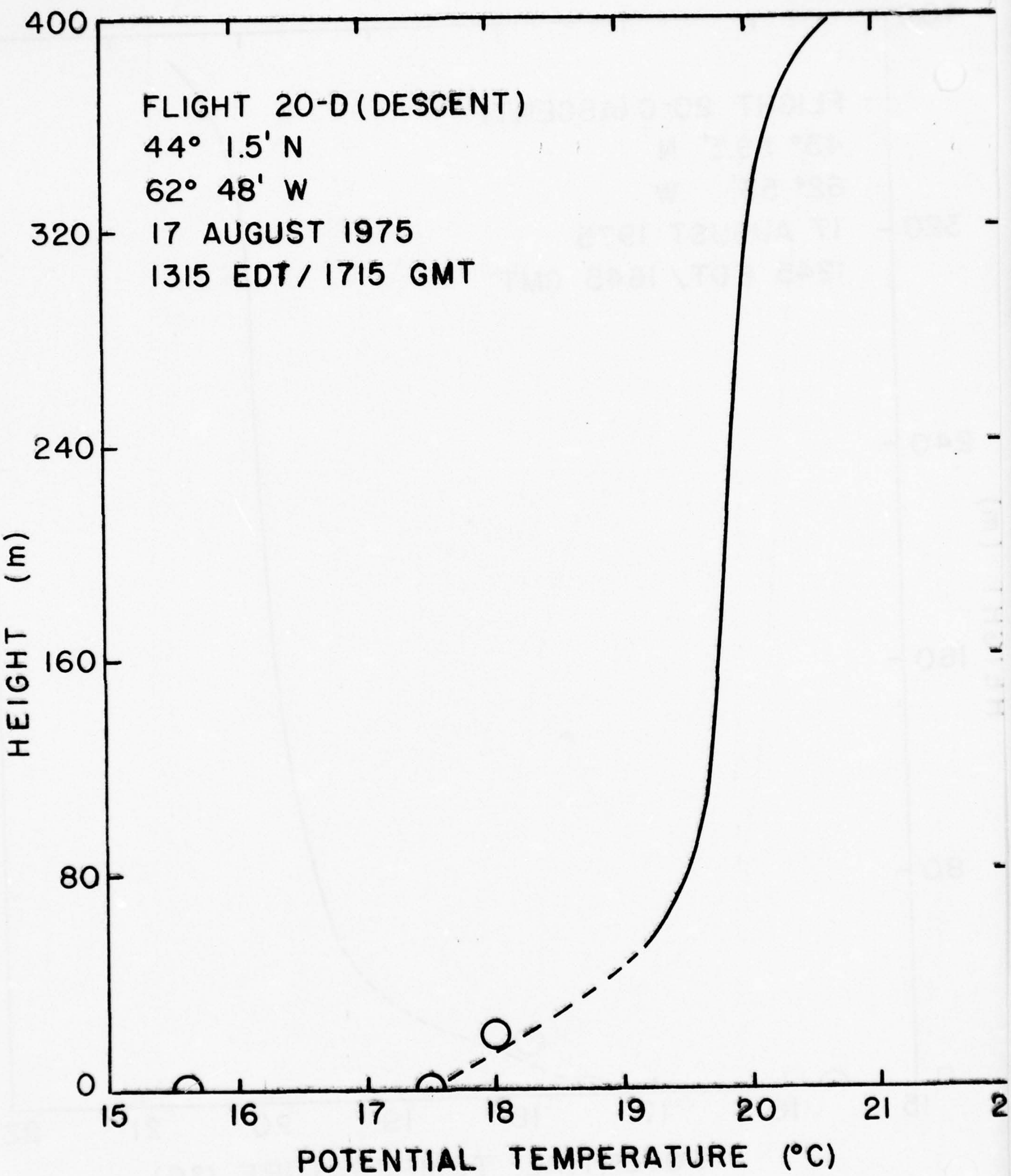

FLIGHT 19-C (ASCENT)
44° 3' N
62° 28' W
17 AUGUST 1975
0640 EDT / 1040 GMT
HEIGHT (m)
0
80
160
240
320
400
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

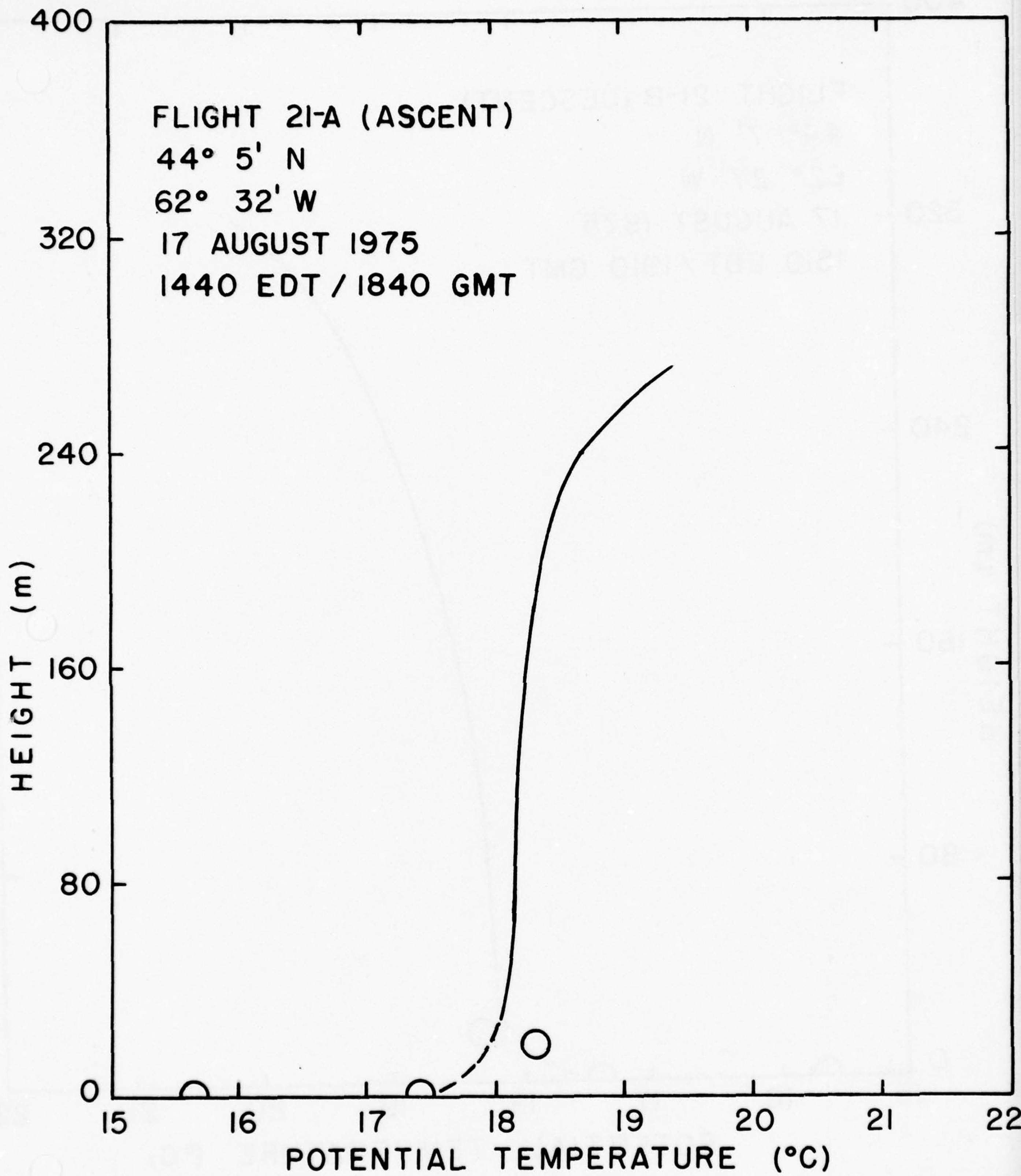

FLIGHT 19-D (DESCENT)
44° 1' N
62° 35' W
17 AUGUST 1975
0710 EDT / 1110 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

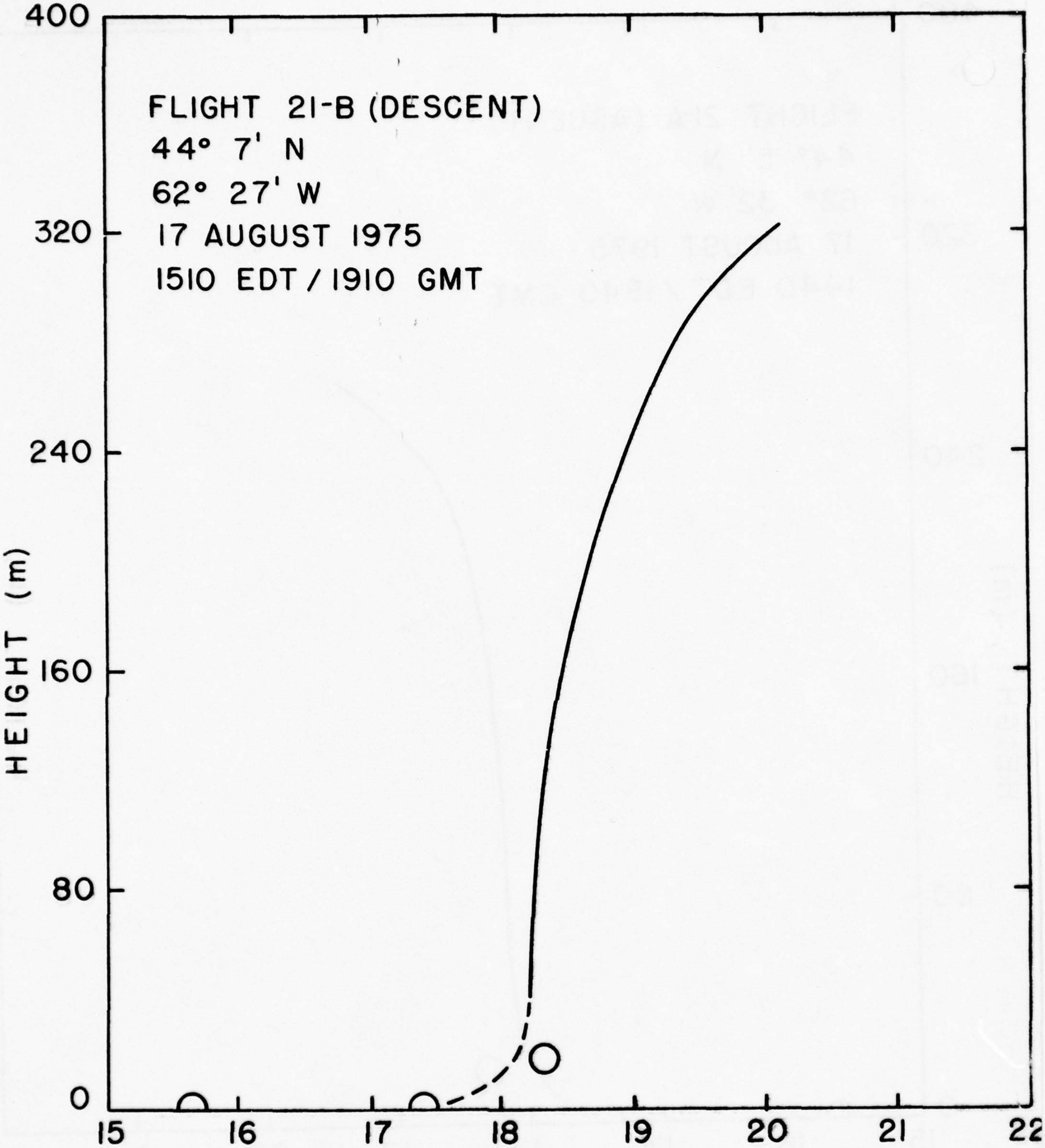

FLIGHT 20-A (ASCENT)
43° 57' N
63° 3' W
17 AUGUST 1975
1145 EDT / 1545 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
POTENTIAL TEMPERATURE (°C)

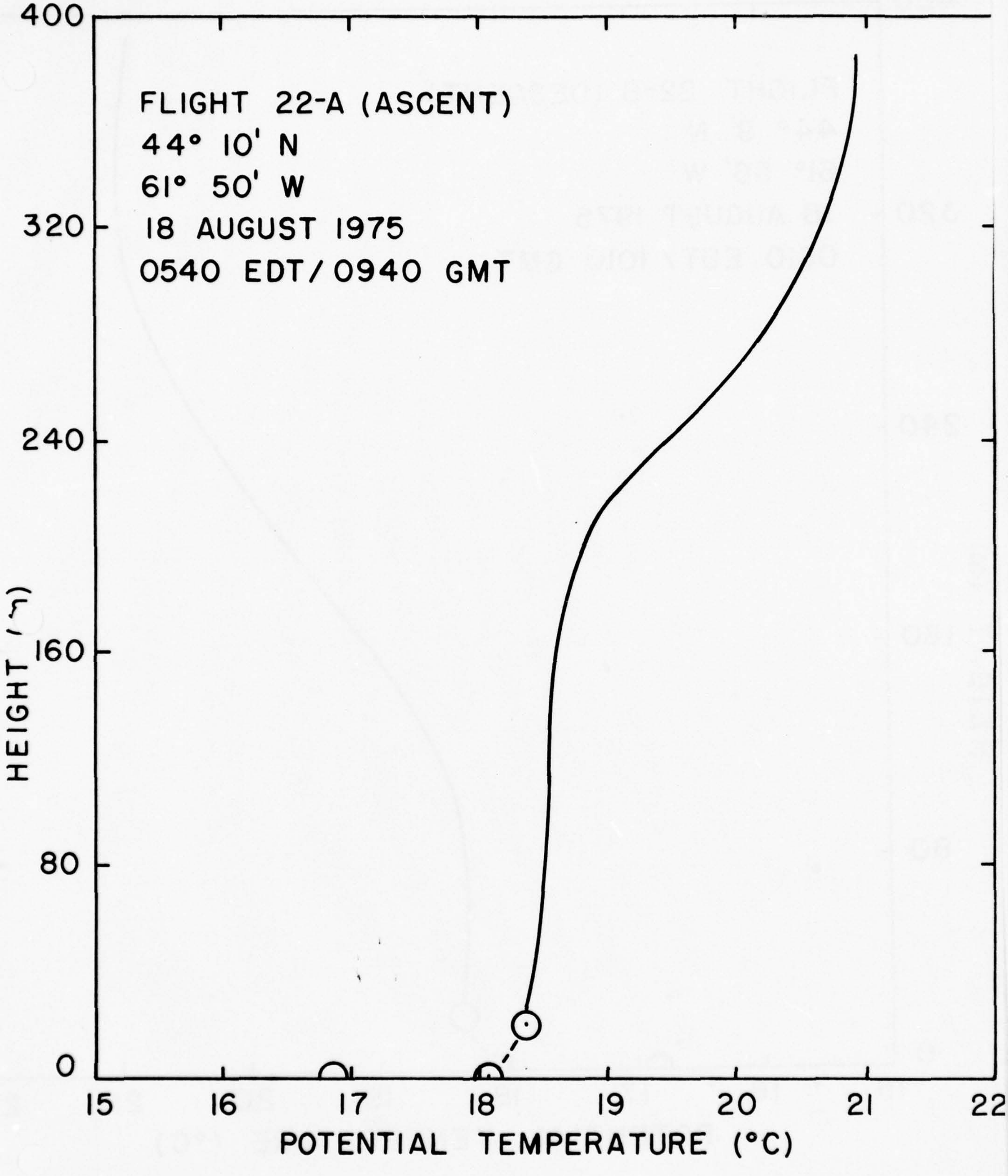

FLIGHT 20-B (DESCENT)
43° 58' N
62° 58' W
17 AUGUST 1975
1215 EDT / 1615 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)


FLIGHT 20-C (ASCENT)
43° 59.5' N
62° 53' W
17 AUGUST 1975
1245 EDT / 1645 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

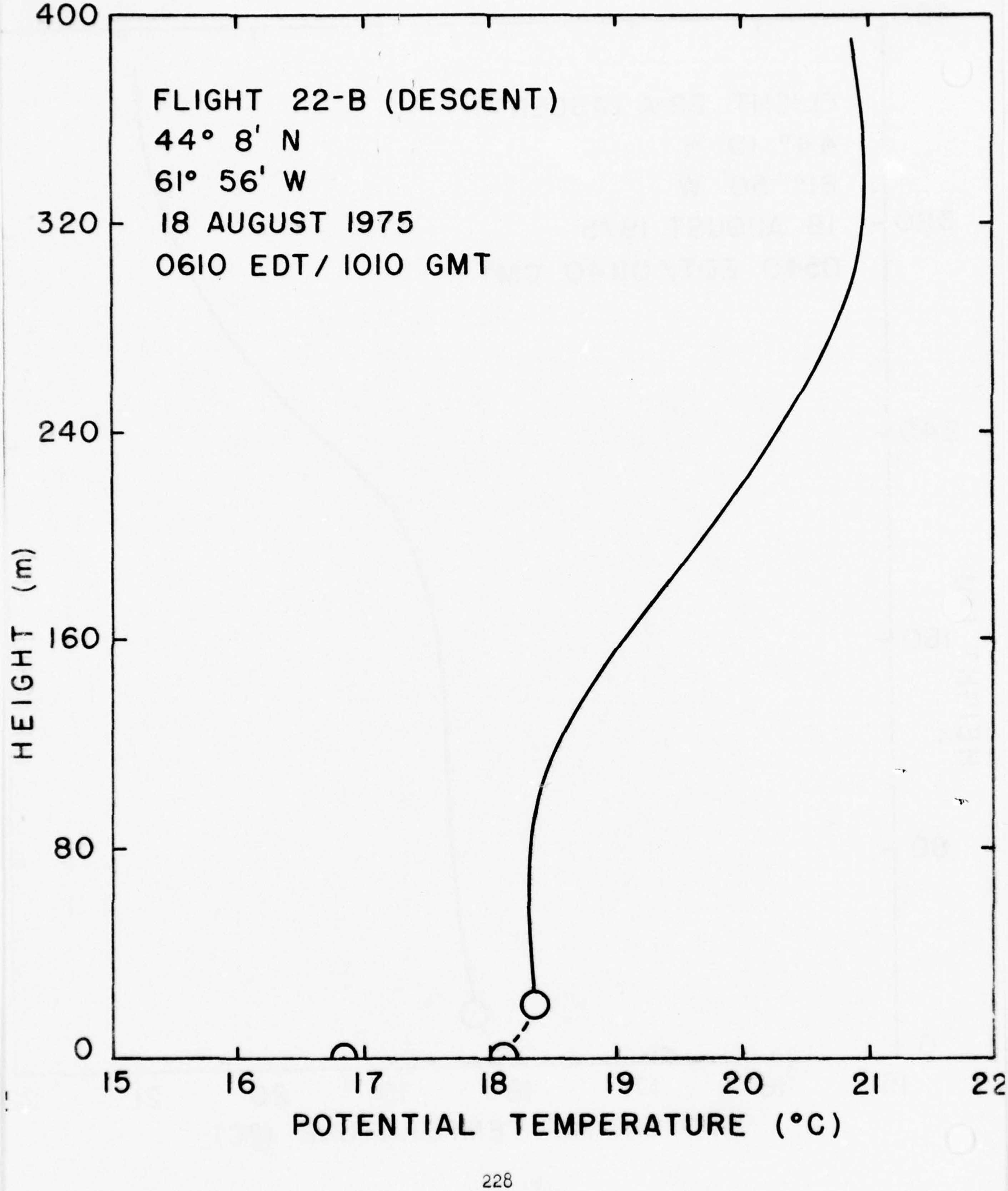

FLIGHT 20-D (DESCENT)
44° 1.5' N
62° 48' W
17 AUGUST 1975
1315 EDT / 1715 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
2
POTENTIAL TEMPERATURE (°C)

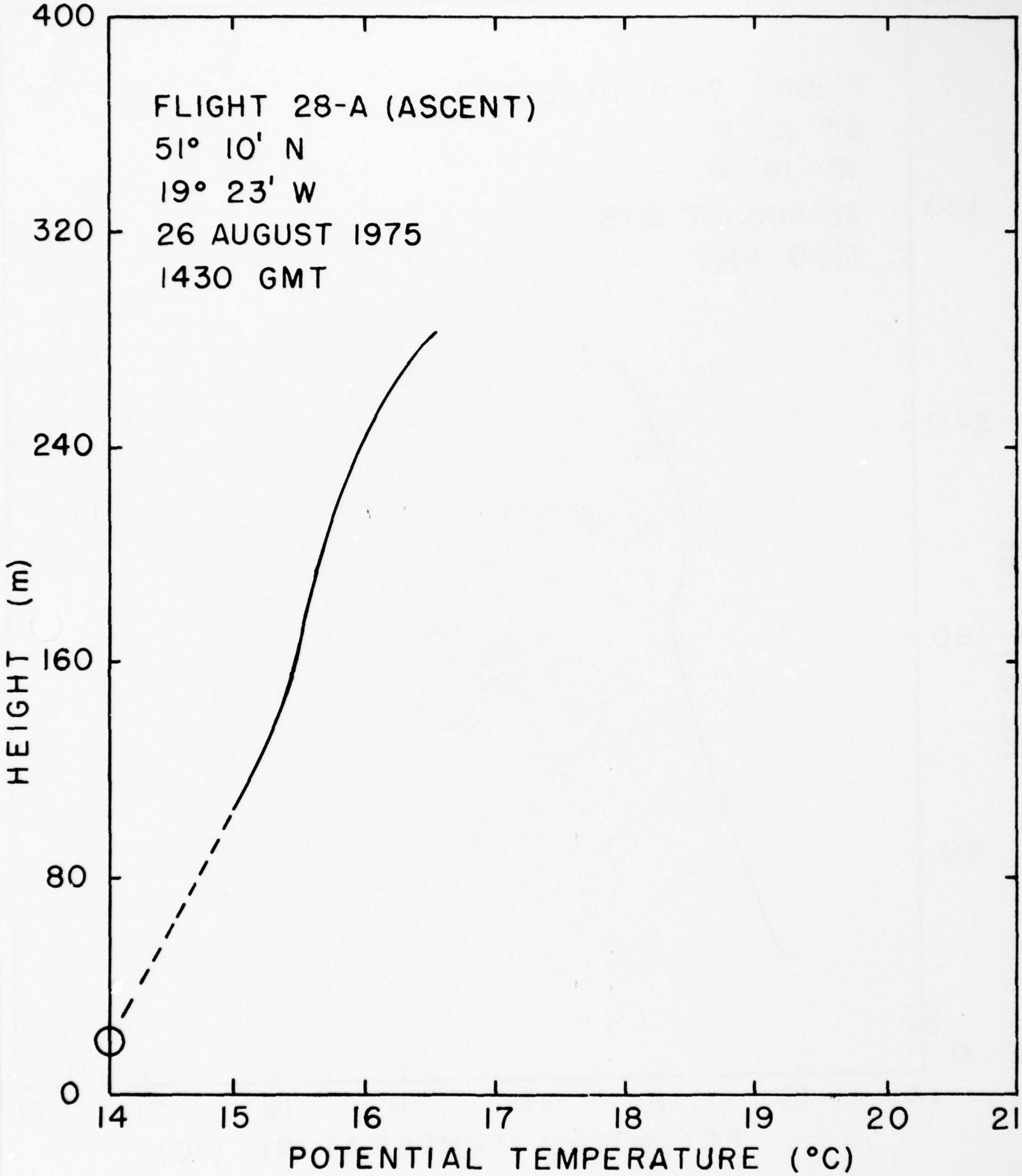

FLIGHT 21-A (ASCENT)
44° 5' N
62° 32' W
17 AUGUST 1975
1440 EDT / 1840 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

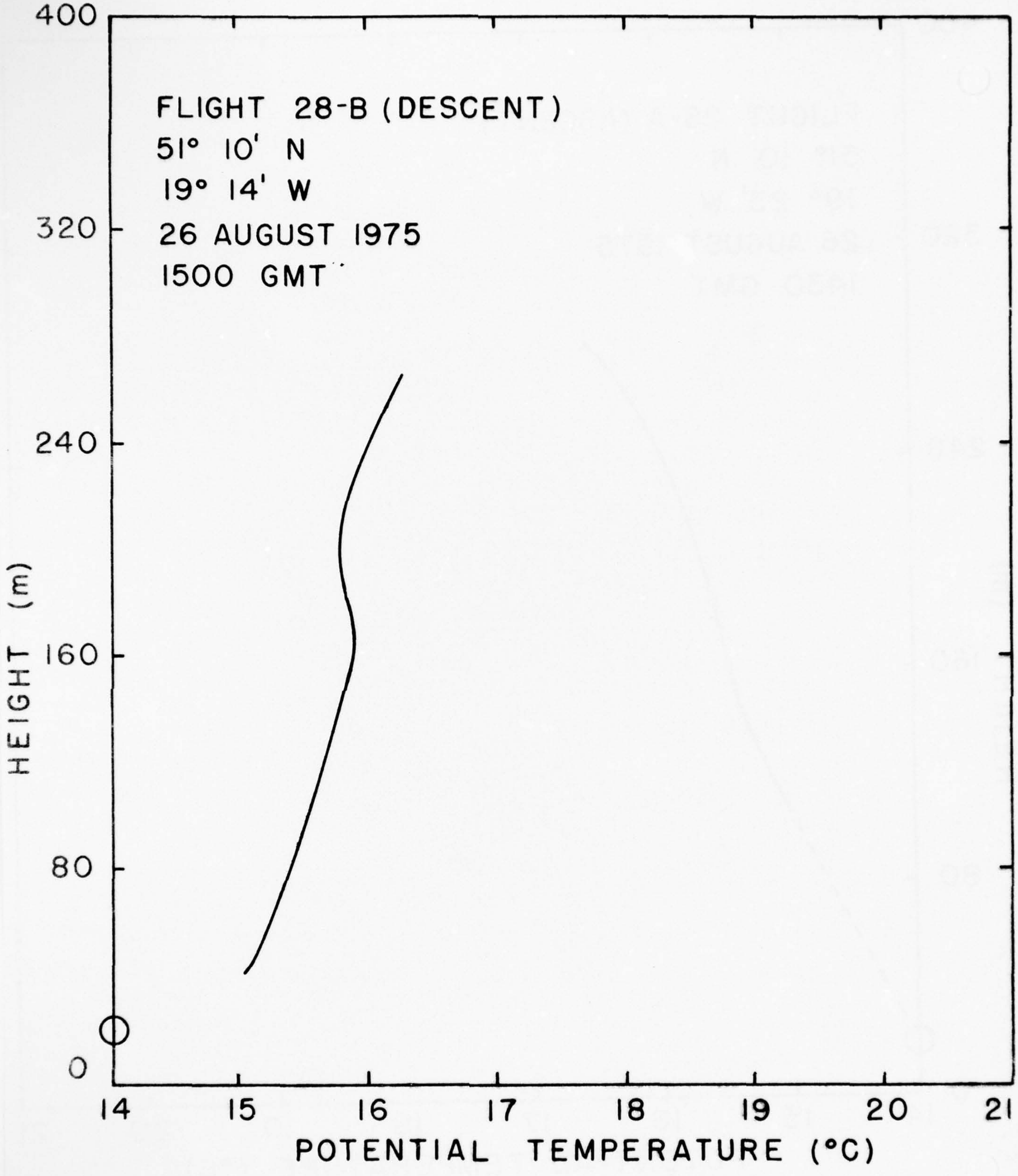

FLIGHT 21-B (DESCENT)
44° 7' N
62° 27' W
17 AUGUST 1975
1510 EDT / 1910 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

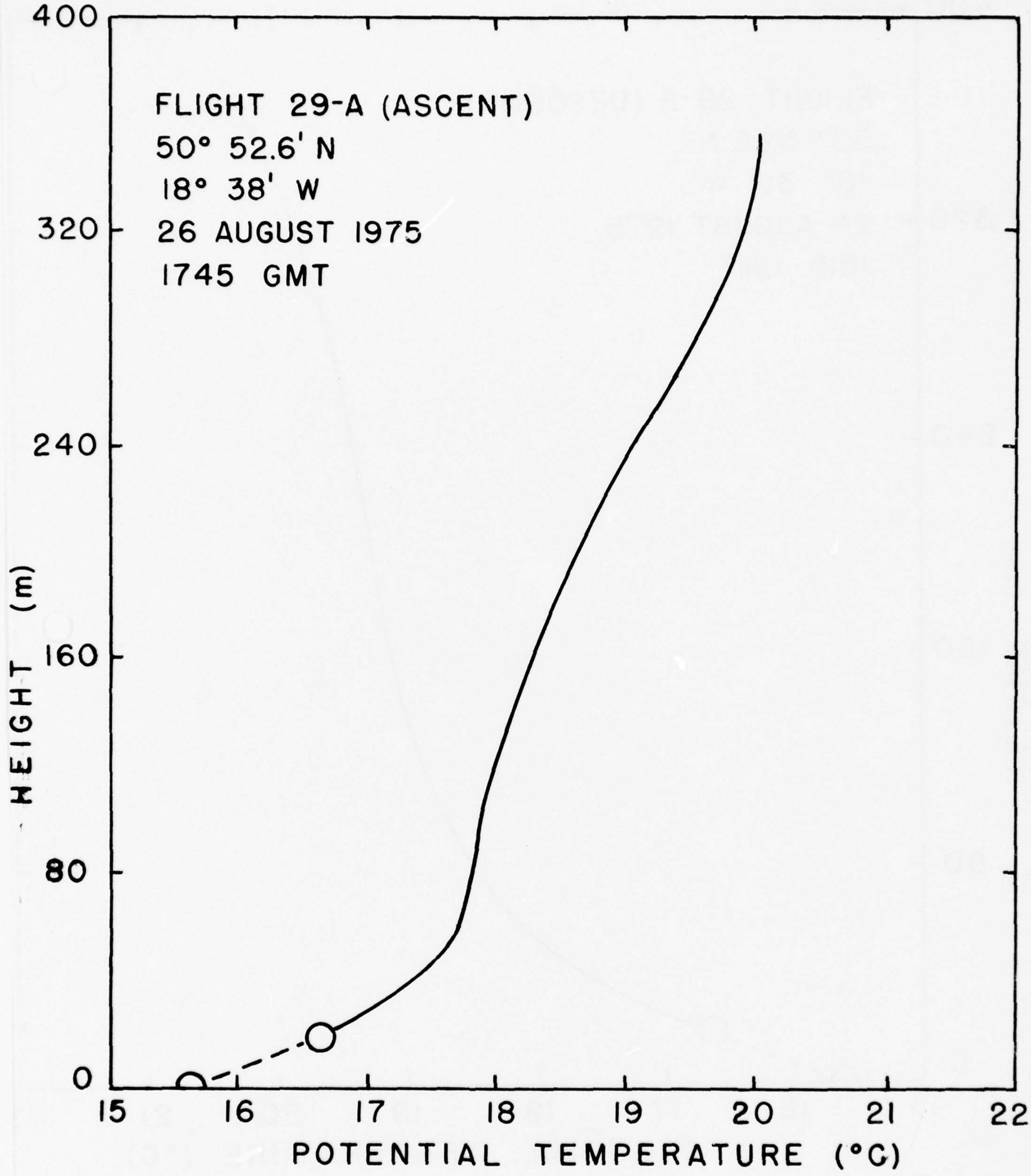


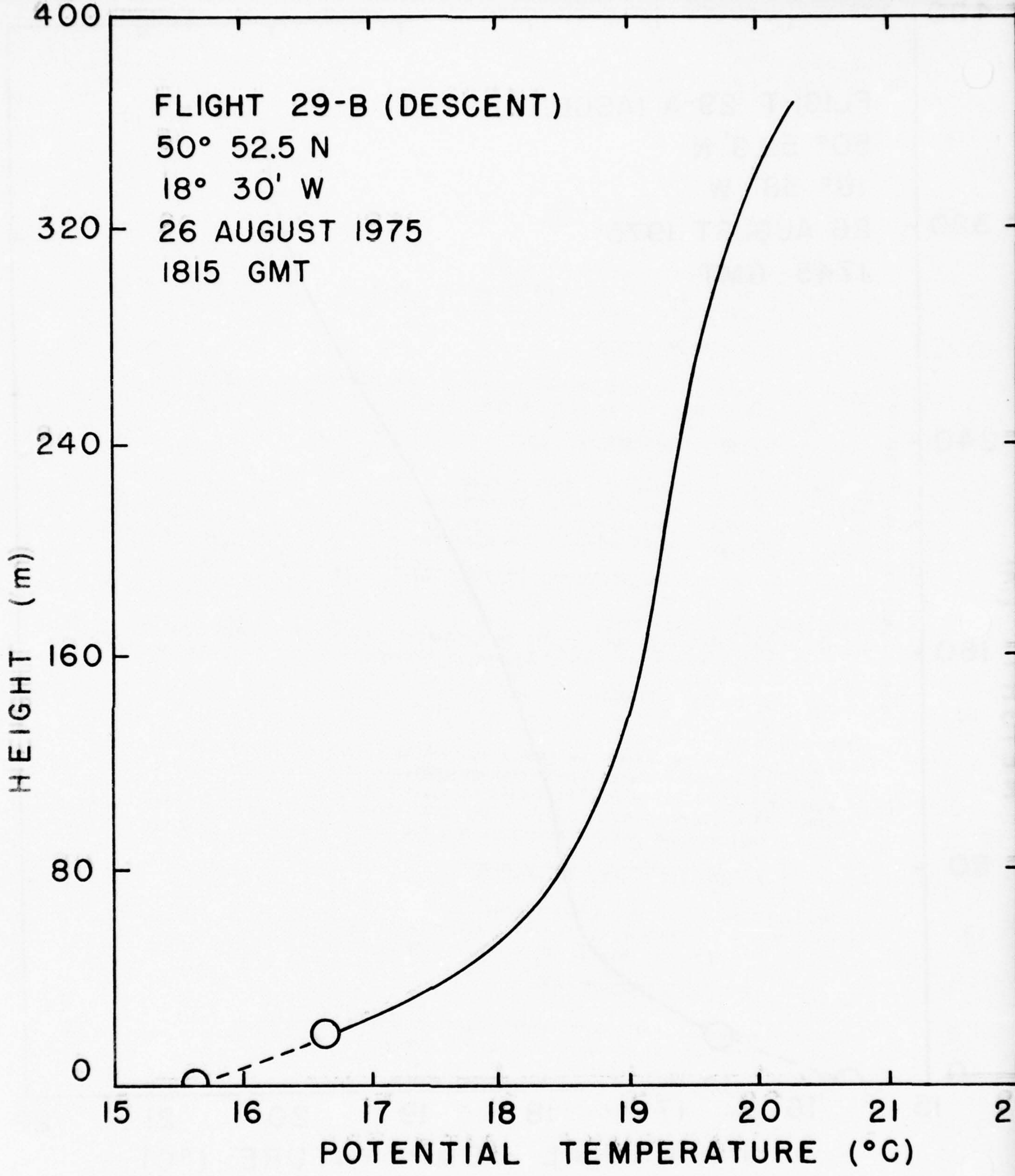
FLIGHT 22-A (ASCENT)
44° 10' N
61° 50' W
18 AUGUST 1975
0540 EDT/0940 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

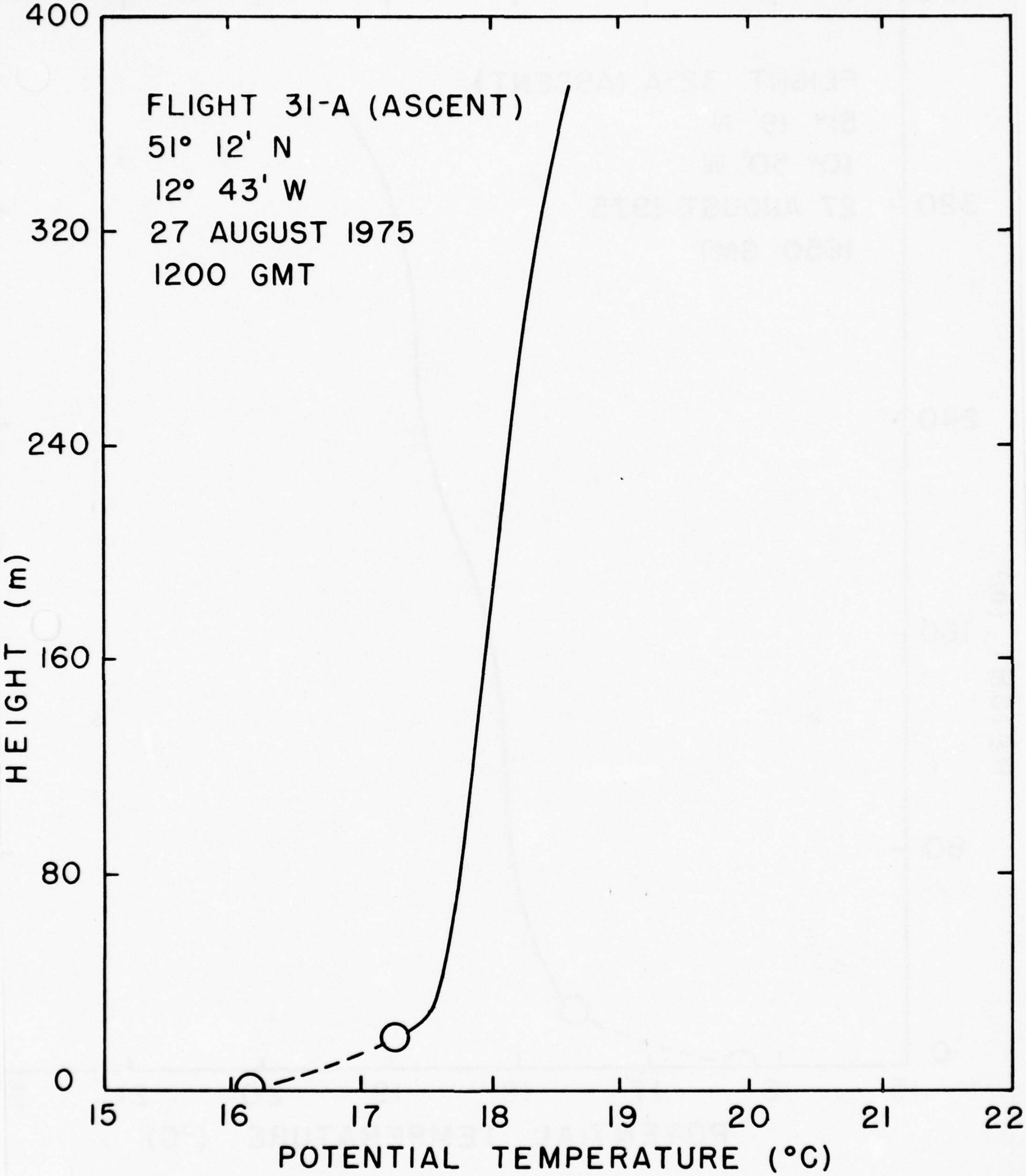

FLIGHT 22-B (DESCENT)
44° 8' N
61° 56' W
18 AUGUST 1975
0610 EDT/ 1010 GMT
400
320
240
160
80
0
HEIGHT (m)
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)

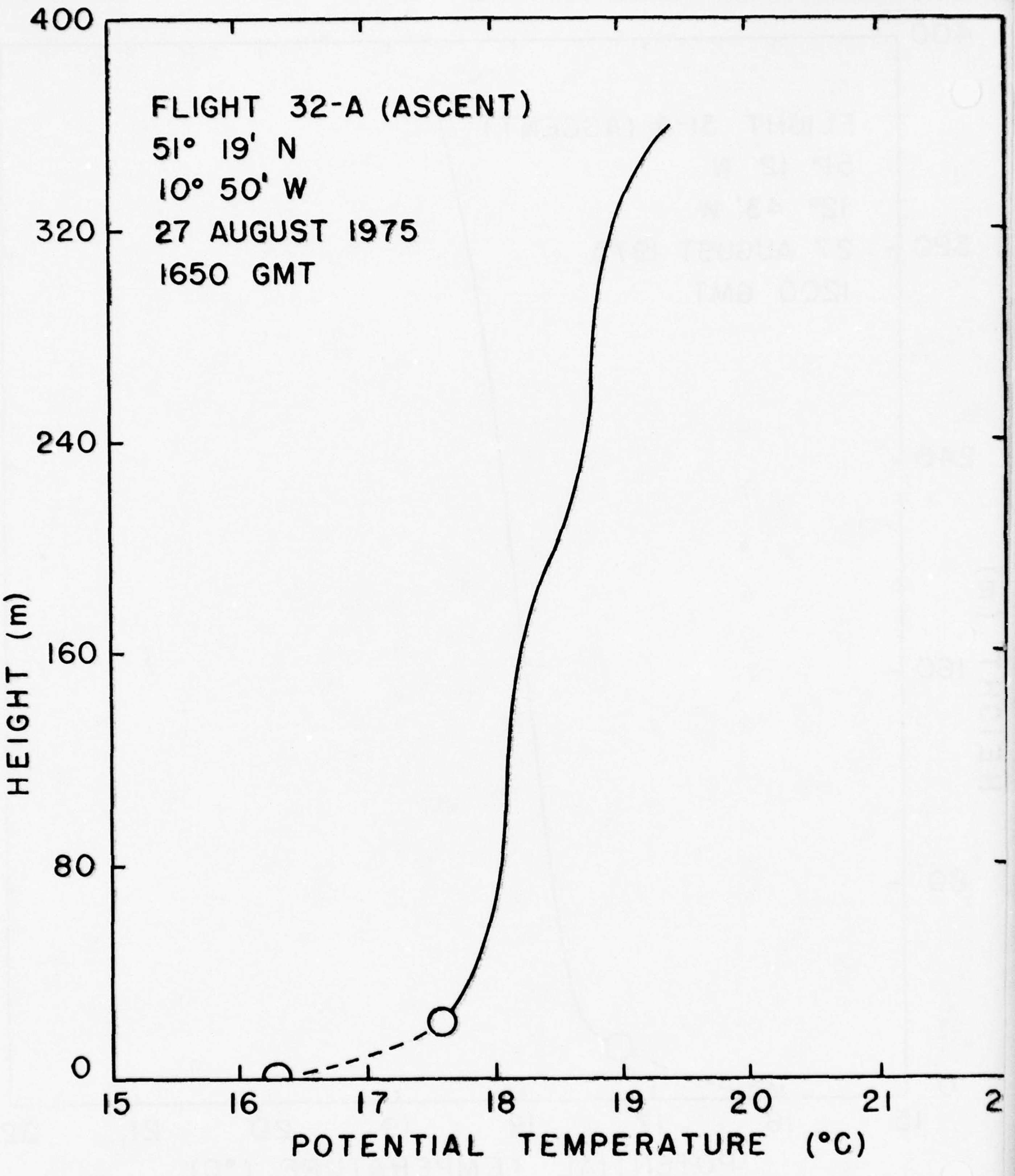

FLIGHT 28-A (ASCENT)
51° 10' N
19° 23' W
26 AUGUST 1975
1430 GMT
HEIGHT (m)
400
320
240
160
80
0
14
15
16
17
18
19
20
21
POTENTIAL TEMPERATURE (°C)

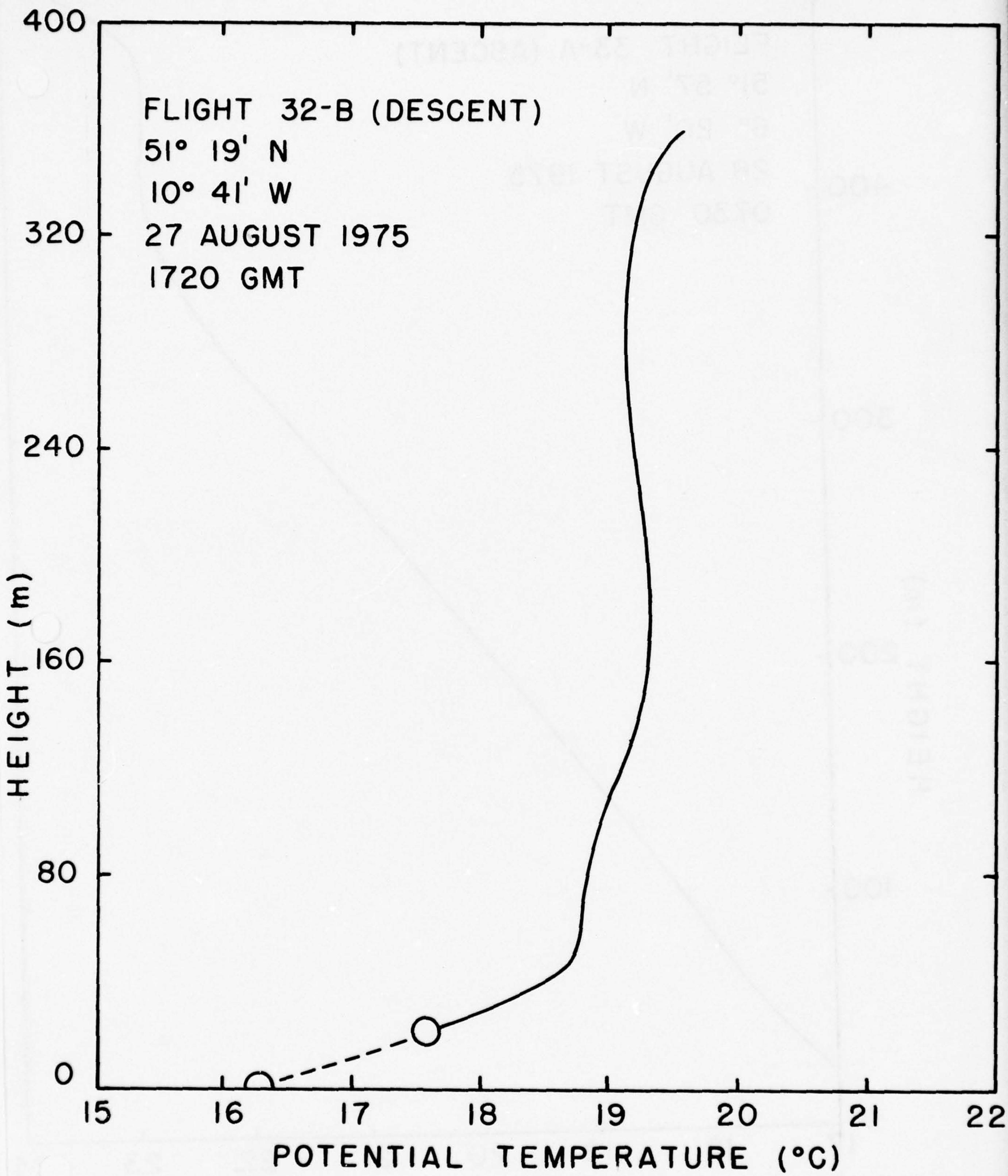

FLIGHT 28-B (DESCENT)
51° 10' N
19° 14' W
26 AUGUST 1975
1500 GMT
HEIGHT (m)
400
320
240
160
80
0
14
15
16
17
18
19
20
21
POTENTIAL TEMPERATURE (°C)

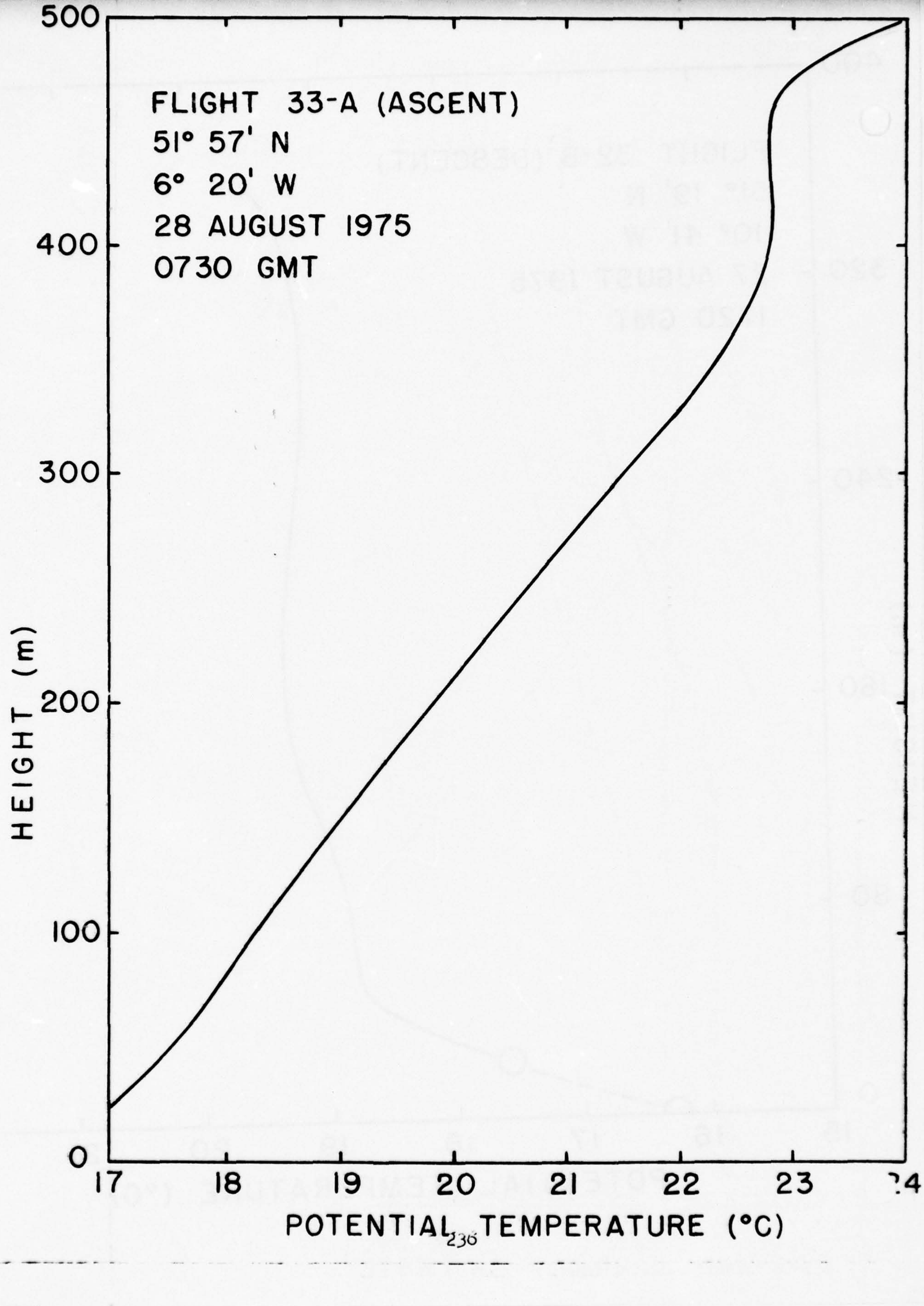

FLIGHT 29-A (ASCENT)
50° 52.6' N
18° 38' W
26 AUGUST 1975
1745 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)


FLIGHT 29-B (DESCENT)
50° 52.5 N
18° 30' W
26 AUGUST 1975
1815 GMT
HEIGHT (m)
POTENTIAL TEMPERATURE (°C)
400
320
240
160
80
0
15
16
17
18
19
20
21
22

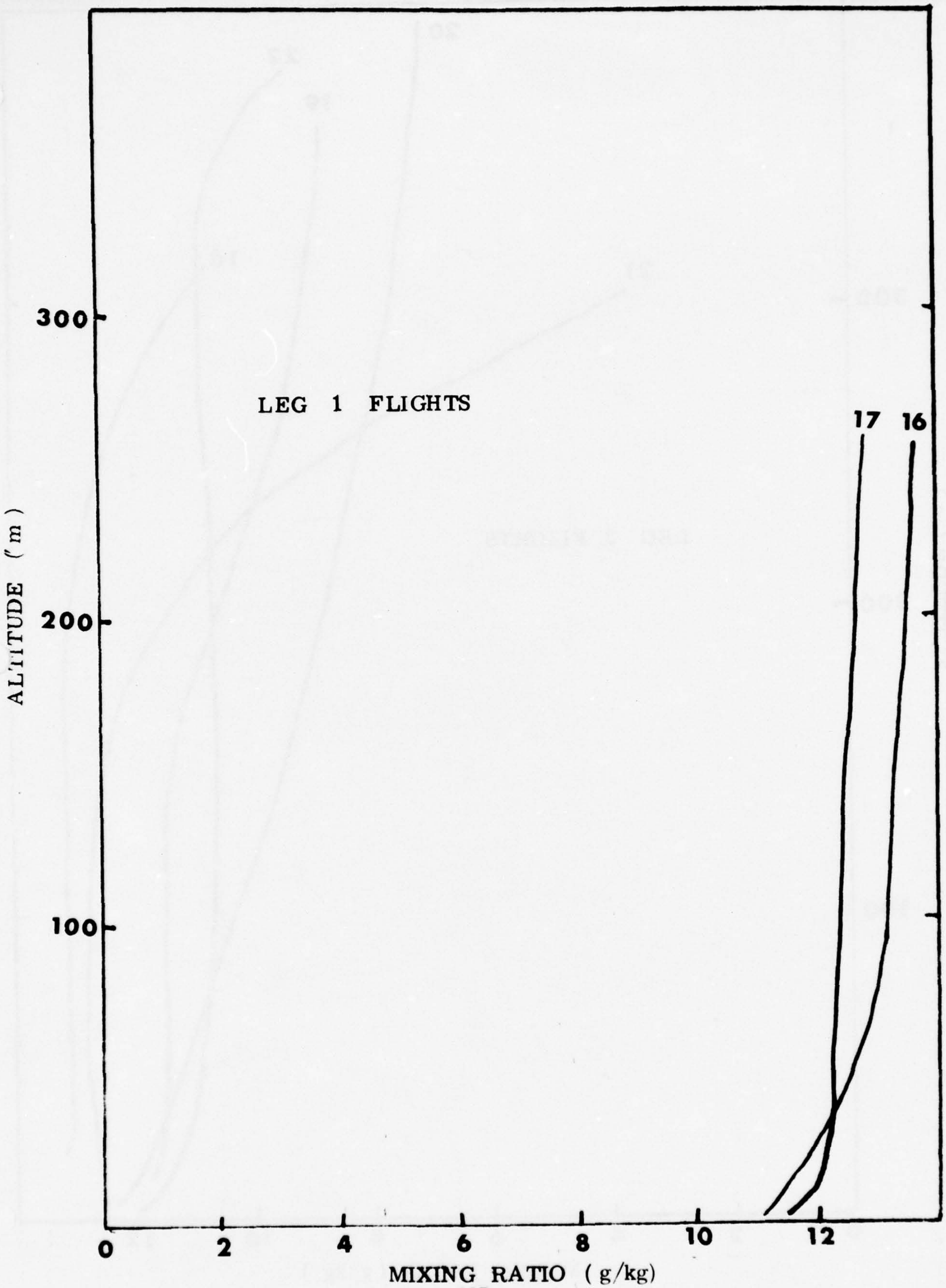

FLIGHT 31-A (ASCENT)
51° 12' N
12° 43' W
27 AUGUST 1975
1200 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)


FLIGHT 32-A (ASCENT)
51° 19' N
10° 50' W
27 AUGUST 1975
1650 GMT
HEIGHT (m)
400
320
240
160
80
0
15
16
17
18
19
20
21
2
POTENTIAL TEMPERATURE (°C)

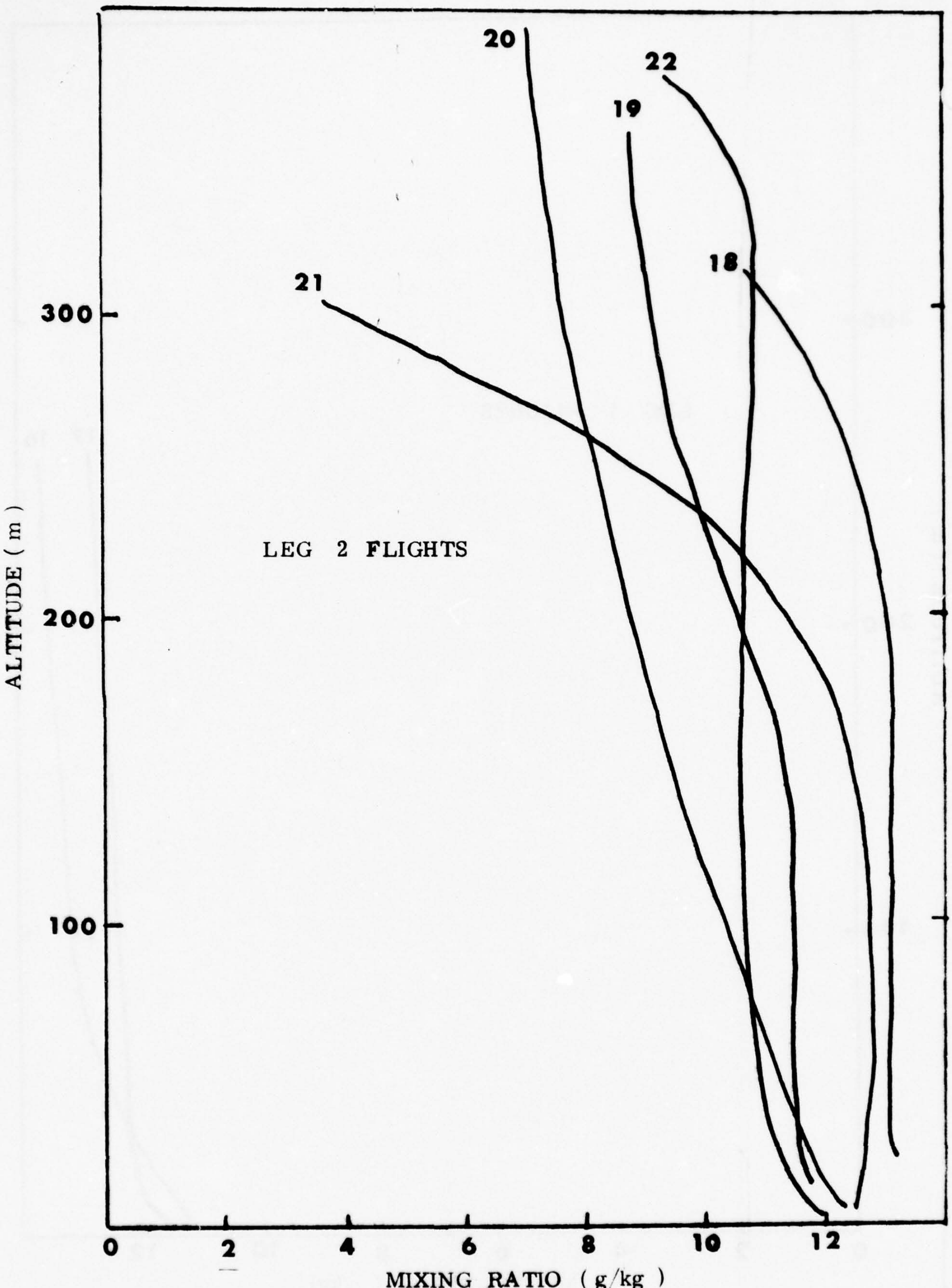

FLIGHT 32-B (DESCENT)
51° 19' N
10° 41' W
27 AUGUST 1975
1720 GMT
HEIGHT (m)
0
80
160
240
320
400
15
16
17
18
19
20
21
22
POTENTIAL TEMPERATURE (°C)



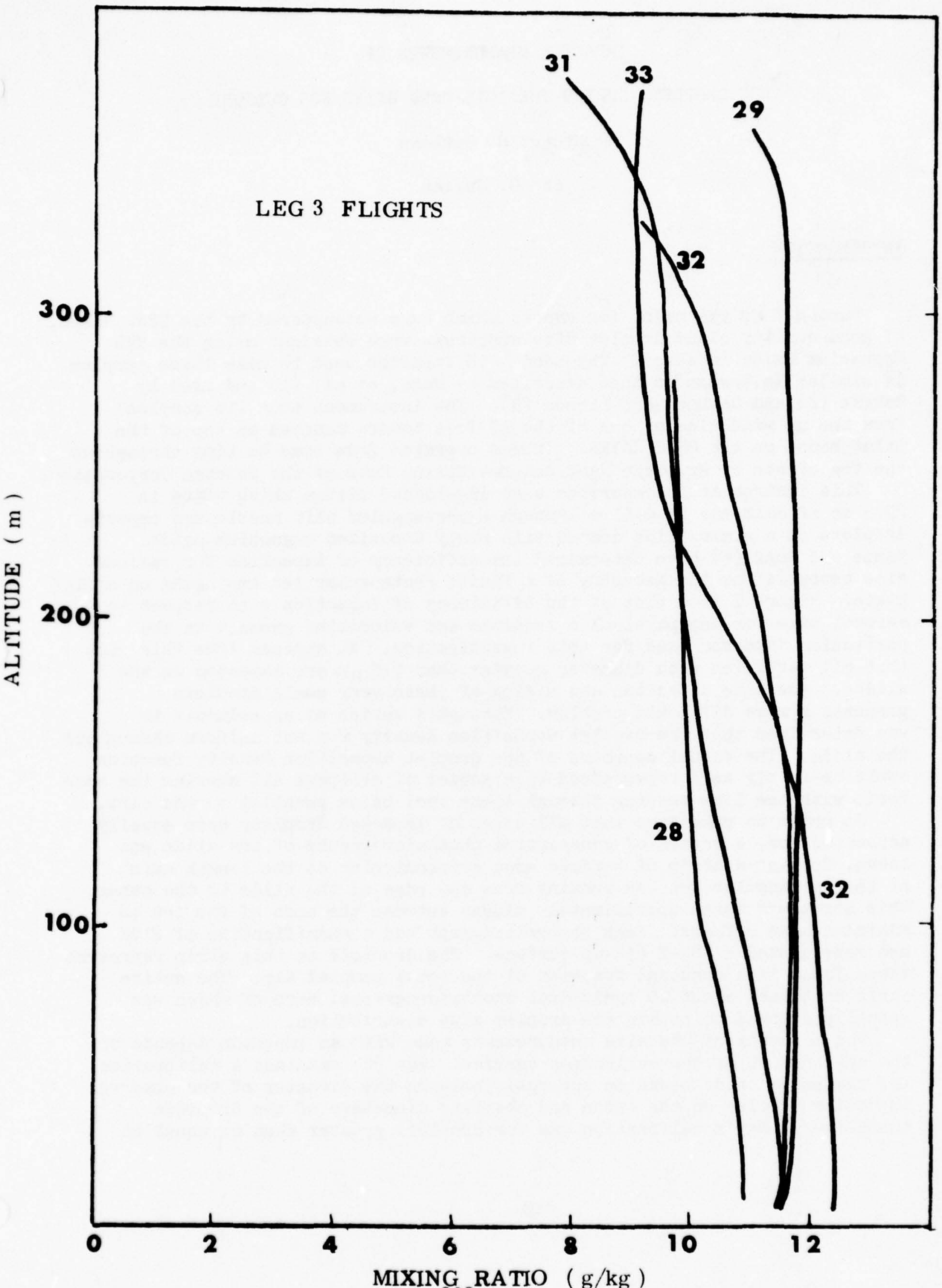
FLIGHT 33-A (ASCENT)
51° 57' N
6° 20' W
28 AUGUST 1975
0730 GMT
HEIGHT (m)
0
100
200
300
400
500
17
18
19
20
21
22
23
24
POTENTIAL TEMPERATURE (°C)



LEG 1 FLIGHTS
17
16
300
200
100
ALTITUDE (m)
0
2
4
6
8
10
12
MIXING RATIO (g/kg)



20
22
19
18
21
300
200
100
ALTITUDE (m)
LEG 2 FLIGHTS
0
2
4
6
8
10
12
MIXING RATIO (g/kg)



LEG 3 FLIGHTS
31
33
29
32
28
32
300
200
100
0
2
4
6
8
10
12
ALTITUDE (m)
MIXING RATIO (g/kg)

IMPACTOR MEASUREMENTS OF

FOG DROPLETS DURING THE 1975 USNS HAYES FOG CRUISE

Stuart G. Gathman

Ben G. Julian

INTRODUCTION

During 7 of the major fog events which were encountered by the USNS HAYES, 47 good quality cloud droplet size spectrums were obtained using the NRL Magnesium Oxide Impactor. The hand held impactor used to make these samples is similar in design to that described by Maze, et al. (1) and used by Ruhnke (2) and Gathman and Larson (3). The instrument took its samples from the up wind side of one of the 15 foot towers mounted on top of the pilot house on the USNS HAYES. It was operated from time to time throughout the fog events by Mr. Gene Mack and Dr. Ulrich Katz of the Calspan Corporation.

This instrument incorporates a spring-loaded piston which takes in 25.8 cc of calm air in 0.01 s through a rectangular slit nozzle and impacts droplets on a glass slide coated with newly deposited magnesium oxide. Ranze and Wong (4) have determined the efficiency of impaction for various size aerosols for the geometry of a finite rectangular jet impinging on a flat plate. Figure 1 is a plot of the efficiency of impaction with respect to aerosol size for the physical dimensions and velocities present in the particular impactor used for this investigation. It appears from this plot that all particles with diameter greater than 2.0 μm are impacted on the slides. Accurate detection and sizing of these very small droplets presents a more difficult problem. Through a series of experiments it was determined that the droplet deposition density was not uniform throughout the slide. The actual contours of the droplet deposition density function could be fairly well represented by a series of ellipses all sharing the same foci, with the line passing through these foci being parallel to the slit.

In order to make sure that all sizes of impacted droplets were equally accounted for, a series of consecutive photomicrographs of the slide was taken, forming a strip of surface area perpendicular to the length axis of the rectangular jet and running from one edge of the slide to the other. This strip was taken approximately midway between the ends of the jet to minimize edge effects. Each photomicrograph had a magnification of 210X and represented a 483-X 654-µm surface. The droplets on this strip represent those found in a constant fraction of the total sampled air. The entire strip contained about 20 individual photomicrographs, each of which was manually scanned to obtain the droplet size distribution.

The accuracy of the size measurements made with an impactor depends on the calibration of the collection surface. May (5) obtained a calibration for magnesium oxide based on the ratio between the diameter of the observed impaction circles on the slide and absolute diameters of the droplets themselves. May's calibration was for droplets greater than or equal to

9.9 μm in diameter. He states that below this size, the magnesium oxide method is of little value for measurement purposes because of grain size of the MgO surface; although for high velocities, sizes of less than 5 μm are observed.

During the sampling process, the impactor used in this fog study had an air velocity at the jet of 74 m/s. This velocity is apparently high enough to cause large quantities of small droplets to leave their impressions on the freshly prepared magnesium oxide slide used in this experiment. These impressions were viewed using oblique lighting where light-dark patterns of the droplet crater are easily identifiable. Consequently, a linear extrapolation of May's calibration curve was used to obtain droplet sizes below 10 μm from the images formed in the magnesium oxide surface.

Shown in the tables I through VII are the droplet spectra obtained with the MgO Impactor during 7 fog events encountered by the USNS HAYES. Each data column represents a sampling at the specified time. The diameter sizes indicated are the mid value of the interval expressed. The numbers indicate normalized values of the counts in a particular channel divided by the width of the channel in μm and expressed as percentage. At the bottom of each column is the visibility measured with the MRI forward scattering probe and corrected for transition errors, Fitzgerald (6), and expressed in meters. The mean diameter is shown and expressed in μm.

The droplet density and the liquid water content are calculated values which are obtained from both the measured size spectrum and the measured visibility.

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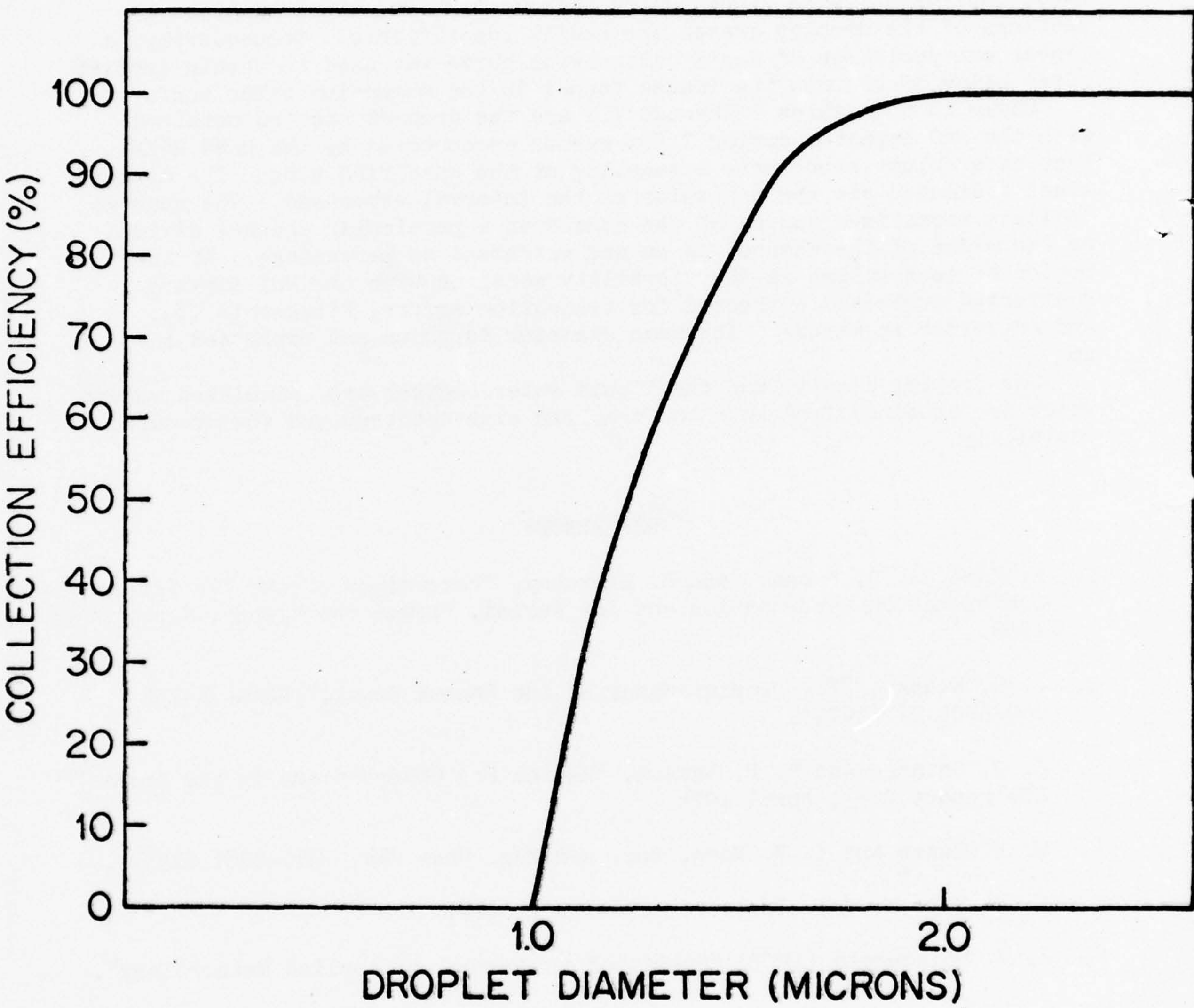
5. K. R. May, J. Sci. Inst. 27, 128-130 (1950).

6. J. W. Fitzgerald (1977) "Submitted to Journal of Applied Meteorology".



COLLECTION EFFICIENCY (%)
100
90
80
70
60
50
40
30
20
10
0
1.0
2.0
DROPLET DIAMETER (MICRONS)

FIGURE 1

TABLE I

2 & 3 August 1975

TIME GMT

DIAMETER (μm)	2330	2355	0007	0313	0337
2.4	0	0	2	0	0
4.2	2	12	29	1	0
6.1	24	21	28	2	3
8.1	39	26	18	3	4
10.2	16	15	6	3	4
12.4	6	4	1	3	3
14.7	4	4	1	5	2
17.1	1	7	1	7	2
19.7	1	3	1	9	3
22.3		0	0	15	4
24.7		0	0	17	4
26.9		0	1	15	3
29.0		1	3	7	4
31.2		2	0	5	8
33.3			1	1	10
35.5					13
37.6					12
39.8					3
41.9					4
44.1					1
vis (m)	350	425	180	250	500
mean (μm)	9	10	9	22	27
n /cc	66	43	93	19	5
lwc (mg/m^3)	54	54	178	134	88

TABLE II

3 AUGUST 1975

TIME GMT

DIAMETER (μm)	2033	2110	2141	2200	2236	2316
2.4	2	0	2	0	0	0
4.2	6	3	4	0	0	4
6.1	10	6	4	6	3	8
8.1	16	11	16	16	7	6
10.2	20	5	10	11	5	12
12.4	12	9	6	3	4	8
14.7	5	7	3	3	7	4
17.1	8	5	3	4	3	9
19.7	4	5	6	6	2	6
22.3	4	6	7	6	8	6
24.7	3	2	11	8	9	4
26.9	0	5	6	4	7	4
29.0	0	7	5	8	13	3
31.2	0	7	2	2	8	7
33.3	1	5	3	6	5	3
35.5		1	1	1	2	1
37.6		1	0	0	2	1
39.8		0	1	0		2
41.9		0		1		0
44.1		1		3		1
vis(m)	1700	1000	1300	1500	1800	2000
mean (μm)	13	20	18	20	21	19
n /cc	6	4	4	3	2	2
lwc (mg/m^3)	17	37	28	26	20	18

TABLE III

4 August 1975

TIME GMT

DIAMETER (μm)	1320	1339	1347	1404	1441
2.4	0	1	0	0	0
4.2	1	5	5	14	7
6.1	18	20	19	21	8
8.1	24	25	22	12	17
10.2	8	5	11	4	12
12.4	4	3	6	6	4
14.7	0	0	3	7	5
17.1	3	2	4	7	1
19.7	4	3	3	6	3
22.3	2	1	1	5	2
24.7	3	0	9	4	3
26.9	1	2	2	0	3
29.0	9	4	3	6	10
31.2	4	5	2	2	2
33.3	4	5	0	0	4
35.5	1	5	0	0	3
37.6	0	2	0	2	3
39.8	1		1		1
41.9	2				1
44.1	1				
vis(m)	900	1100	1000	500	500
mean (μm)	16	16	14	14	18
n /cc	7	6	9	20	11
lwc(mg/m^3)	42	36	33	65	78

TABLE III (CONTINUED)

4 August 1975

TIME GMT

DIAMETER (μm)	1538	1626	1759	1829
2.4	0	0	0	0
4.2	8	7	3	9
6.1	12	5	13	18
8.1	21	12	20	11
10.2	12	4	13	7
12.4	7	2	8	5
14.7	3	4	4	6
17.1	2	6	5	2
19.7	1	1	2	5
22.3	1	5	3	1
24.7	0	5	3	3
26.9	0	4	2	4
29.0	2	5	2	4
31.2	7	7	2	5
33.3	1	4	4	3
35.5	6	6	2	3
37.6	0	3	2	1
39.8	2	1	1	2
41.9		5		
44.1		2		
vis(m)	400	1000	350	300
mean (μm)	16	22	15	16
n /cc	17	3	20	21
lwc(mg/m^3)	107	42	102	118

TABLE IV

5 August 1975

TIME GMT

DIAMETER (μm)	0920	1355	1403
2.4	0	0	0
4.2	2	16	10
6.1	5	11	15
8.1	16	19	7
10.2	6	9	6
12.4	2	4	7
14.7	2	1	9
17.1	1	3	13
19.7	0	5	10
22.3	1	3	3
24.7	6	5	5
26.9	5	4	4
29.0	6	5	1
31.2	8	3	2
33.3	10	3	0
35.5	6	1	2
37.6	4		
39.8	4		
41.9	2		
44.1	3		
vis(m)	140	180	510
mean (μm)	24	15	15
n /cc	24	42	17
lwc(mg/m^3)	310	180	55

TABLE V

6 August 1975

TIME GMT

DIAMETER (μm)	0510	0522	0616	0710	0746	0814	0828
2.4	0	0	0	1	2	0	0
4.2	0	3	12	15	17	13	10
7.1	25	11	28	22	30	28	15
8.1	29	48	36	41	33	26	37
10.2	4	4	13	9	10	8	16
12.4	5	5	3	4	1	3	7
14.7	1	2	3	2		3	7
17.1	1	2	2	0		4	1
19.7	1	0	0	0		1	1
22.3	3	0		0		0	1
24.7	4	4		0		1	0
26.9	1	2		0		0	1
29.0	2	1		1		0	0
31.2	1	0				1	0
33.3	0	5				0	0
35.5	2	2				2	0
37.6	2					1	1
39.8	1						
41.9	0						
44.1	1						
vis(m)	400	730	690	320	260	300	210
mean (μm)	14	13	8	8	7	10	11
n /cc	20	12	45	100	150	47	70
lwc(mg/m^3)	94	48	22	53	53	100	140

TABLE VI

7 August 1975

TIME GMT

DIAMETER (μm)	0826	0838	0857	0916	0939
2.4	0	0	0	4	5
4.2	10	9	25	21	41
6.1	19	25	27	22	20
8.1	21	29	25	36	20
10.2	10	13	15	11	4
12.4	4	7	4	2	2
14.7	4	2			0
17.1	1	3			1
19.7	0	0			0
22.3	1	2			1
24.7	2	0			
26.9	1	2			
29.0	2	0			
31.2	2	0			
33.3	2	0			
35.5	2	0			
37.6	2	0			
3[illegible].8	0	0			
41.9	2	0			
44.1	3	1			
vis(m)	150	520	330	380	280
mean(μm)	14	11	8	7	7
n /cc	47	28	110	110	130
lwc(mg/m^3)	390	61	50	31	68

TABLE VI (CONTINUED)

7 August 1975

TIME GMT

DIAMETER (µm)	0959	1014	1033	1052	1112
2.4	0	0	0	0	0
4.2	5	20	7	0	24
6.1	7	31	9	1	27
8.1	19	24	28	9	22
10.2	18	3	15	18	9
12.4	15	3	11	15	4
14.7	11	3	8	13	3
17.1	12	1	2	11	0
19.7	1	2	3	7	1
22.3	3	2	2	4	0
24.7	1	0	2	4	0
26.9		1	0	3	0
29.0		1	1	4	1
31.2		0	1	2	1
33.3		0	0	0	
35.5		2	0	1	
37.6		0			
39.8			1		
41.9					
44.1					
vis(m)	170	170	120	130	220
mean (µm)	13	10	13	16	9
n /cc	76	100	93	60	98
lwc(mg/m^3)	140	160	250	220	120

TABLE VII

7-8 August 1975

TIME GMT

DIAMETER (μm)	2251	0432	0627	0804	0907	0932	0938
2.4	0	0	3	0	0	0	28
4.2	18	8	24	7	12	10	23
6.1	19	2	16	20	27	25	8
8.1	17	3	16	42	43	44	4
10.2	11	0	9	11	10	12	2
12.4	5	5	0	2	4	3	0
14.7	7	4	1	4			0
17.1	5	7	1	0			2
19.7	2	8	0	1			3
22.3	1	9	0	2			1
24.7	1	4	0	0			1
26.9	2	5	4	0			1
29.0	2	6	1	0			2
31.2	1	3	0	0			3
33.3		1	0	0			1
35.5		2	1	1			2
37.6		2	1	1			0
39.8		6	3	1			2
41.9		2	1				1
44.1		1					2
vis(m)	400	170	150	200	230	260	290
mean (μm)	12	20	12	10	8	8	12
n /cc	31	25	59	74	150	98	26
lwc(mg/m^3)	72	230	280	150	65	93	150

Droplet Size Spectra

as Measured by the

PMS Cloud Droplet Spectrometer Probes

Richard K. Jeck

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Fog droplet number densities (number per unit volume) and size spectra over the range 0.7 to 180μ diameter were obtained from aboard the USNS Hayes for most of the fog events encountered during the cruise. The fog droplets were monitored continuously at about the 21 meter level with an Axially Scattering Spectrometer Probe (ASSP) and an Optical Array Probe (OAP) manufactured by Particle Measuring Systems (PMS), Inc. The ASSP has four selectable size ranges covering the interval 0.7 to 46μ diameter and each range is subdivided into fifteen particle size categories, or channels, as listed in Table 1. Similarly the OAP categorized droplets into fifteen size channels over the range 7 to 180μ. The observed droplet count accumulated in each size channel during one minute intervals was recorded at the end of each minute of the cruise.

The data tables contain the following information for each fog listed.

1. Printed at top of the first page of data for each fog is the fog identification number, using the numbering scheme adopted by Calspan, and the day (EDT) of the observations.

2. The data in the body of the tables are arranged into groups of four lines each.

(a) The first line contains the hour hh and minute mm at which the data were recorded. The second entry lists the visibility (VSBY) in meters, as indicated at the time hh mm by the MRI model 1580 Fog Visiometer positioned at the same location as the PMS probes. The remaining six entries on the first line contain the indicated number density in each of the first six size channels of the OAP. These values are computed from the raw data (droplet counts per minute in each size channel) by the use of the simple relationship,

$$D = N/(VW),$$

where, for each size channel, D is the number density (number of droplets per cm^3 per micron radius), N is the recorded droplet count accumulated during the minute ending at time hh mm, V is the volume of air (cm^3) sampled by the droplet spectrometer during the preceding minute, and W is the width of the size channel in terms of droplet radius.

(b) The first entry on the second line is the range (1, 2, 3, or 4) in use on the ASSP during the one minute measuring interval. The remaining

fifteen entries in the group contain the droplet number density for each of the fifteen size categories in the stated range of the ASSP and are obtained with the use of the same formula described above.

(c) The number densities are expressed in computerized scientific notation where 1.4E+02, for example, stands for $1.4 \times 10^{+2}$.

In order to preserve the uniquely fine size resolution of the ASSP data for applications such as precise comparisons with theoretical or other droplet size spectra, for example, a numerical, tabular form was chosen for presenting the data. Such a voluminous format requires, however, that only selected data from many of the fogs be included in order to keep the number of pages down to a reasonable amount. Thus, except for some cases where valid measurements were not obtained, data are included for the following situations.

(a) Continuous data records at and near the fog boundaries where the droplet spectra change rapidly.

(b) Continuously in the midst of those fogs where the VSBY and drop spectra were quite variable.

(c) Continuously for most cases where the ASSP range was changed frequently. (Since the ASSP can be operated on only one range at a time, frequent range changes are necessary if the droplet spectrum is to be sampled with maximum resolution over the entire 0.7-46μ diameter interval.)

(d) At 15 minute intervals in the midst of fogs that appeared to be fairly uniform.

In several fog events the OAP was not operational, and in these cases the entries are all zero for the OAP.

The droplet data are believed to be accurate, although in cases where more than 10,000 droplets were recorded per minute in the <u>first</u> size channel of the ASSP the computer will enter an erroneous value for this channel in the tables.

Due to the instrument sampling volume geometry, the MRI Fog Visiometer can be in error by a factor of up to 1.7 in the indicated VSBY, depending on the drop size distribution (Fitzgerald). The error factor is essentially zero for droplets smaller than 2μ diameter but increases to a maximum of about 1.7 for droplets larger than 15μ diameter. The error has the effect of under-estimating the VSBY. Thus, in a fog where the true VSBY is 400m, for example, the Visiometer would read as high as $400\text{m} \times 1.7 = 680\text{m}$ if the droplets were all larger than 15μ. In actual fogs, the poly disperse droplet size spectrum prohibits the use of a simple correction. In general, the VSBY indicated by the MRI Visiometer will be greater than that indicated by other instruments which more accurately measure the visibility.

In addition, the MRI Visiometer readings are in error prior to 1200 EDT on August 4 for cases where a strong headwind was present along with fog or heavy haze. This is due to the fact that the instrument was

originally installed in an unsuitable location where the airflow was deflected above the Visiometer during strong headwind conditions. Thus the instrument was not properly exposed to the ambient droplet population and the result was a significant over-estimation of the VSBY. This is most noticeable during fogs 4A, and 4C2, and it probably also affects VSBY measurements in fogs 2B and 2C. Beginning with fog 4C4 on August 4, the Visiometer was repositioned properly and reads correctly thereafter, except for the inherent errors due to the sampling volume geometry.

Finally, for indicated visibilities of 10,000m or greater, the computer prints "9999" for the VSBY entry in the tables.

References

J.W. Fitzgerald, "Angular Truncation Error of the Integrating Nephelometer in the Fog Droplet Size Range," submitted to J. Appl. Meteorology, 1976.

TABLE 1. Calibration Data for PMS Probes

Axially Scattering Spectrometer Probe (ASSP)

Channel Number	Range 4 (0.37 - 4.4μ) Radius at ctr. of chan.	Range within chan. limits	Range 2 (0.4 - 7.7μ) Radius at ctr. of chan.	Range within chan. limits
1	0.42μ	0.37 - 0.45μ	0.55μ	0.42 - 0.70μ
2	0.52	0.45 - 0.60	0.88	0.70 - 1.05
3	0.72	0.60 - 0.82	1.25	1.05 - 1.45
4	0.95	0.82 - 1.05	1.65	1.45 - 1.85
5	1.18	1.05 - 1.30	2.10	1.85 - 2.38
6	1.40	1.30 - 1.52	2.65	2.38 - 2.92
7	1.65	1.52 - 1.75	3.20	2.92 - 3.48
8	1.88	1.75 - 2.05	3.75	3.48 - 4.02
9	2.22	2.05 - 2.38	4.30	4.02 - 4.58
10	2.55	2.38 - 2.72	4.80	4.58 - 5.10
11	2.90	2.72 - 3.08	5.35	5.10 - 5.60
12	3.22	3.08 - 3.40	5.85	5.60 - 6.15
13	3.58	3.40 - 3.75	6.40	6.15 - 6.70
14	3.90	3.75 - 4.08	7.00	6.70 - 7.25
15	4.25	4.08 - 4.42	7.50	7.25 - 7.75

	Range 3 (0.7 - 15.5μ)		Range 1 (1.05 - 23.2μ)	
1	1.05μ	0.7 - 1.4μ	1.65μ	1.0 - 2.2μ
2	1.8	1.4 - 2.2	3.0	2.2 - 3.7
3	2.8	2.2 - 3.3	4.5	3.7 - 5.2
4	3.8	3.3 - 4.3	6.0	5.2 - 6.7
5	4.85	4.3 - 5.3	7.5	6.7 - 8.3
6	5.9	5.3 - 6.4	9.0	8.3 - 9.8
7	7.0	6.4 - 7.5	10.5	9.8 -11.3
8	8.0	7.5 - 8.5	12.0	11.3 -12.7
9	9.0	8.5 - 9.5	13.5	12.7 -14.2
10	10.0	9.5 -10.5	15.0	14.2 -15.7
11	11.0	10.5 -11.5	16.5	15.7 -17.2
12	12.0	11.5 -12.5	18.0	17.2 -18.7
13	13.0	12.5 -13.5	19.5	18.7 -20.2
14	14.0	13.5 -14.5	21.0	20.2 -21.7
15	15.0	14.5 -15.5	22.5	21.7 -23.2

Optical Array Probe (OAP)

Channel Number	Radius at ctr. of chan.	Range within chan. limits
1	6μ	3.5 - 8.5μ
2	11	8.5 - 13.5
3	16	13.5 - 18.5
4	21	18.5 - 23.5
5	26	23.5 - 28.5
6	31	28.5 - 33.0
7	35	33.0 - 38.0
8	40	38.0 - 43.0
9	45	43.0 - 48.0
10	50	48.0 - 53.0
11	55	53.0 - 58.0
12	60	58.0 - 62.5
13	65	62.5 - 67.5
14	70	67.5 - 72.5
15	75	72.5 - 77.5

Fog 2A. August 2 (Day 214) 1975

DAY 214 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = OAP LINES 2,3&4 = ASSP

HOUR VSBY						
1920 5432	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+01	1.8E+02	1.2E+02	8.1E+01	5.1E+01	2.1E+01
	2.1E+00	3.9E-01	2.9E-01	2.2E-01	9.1E-02	3.9E-02
	3.9E-02	6.5E-02	6.5E-02			
1921 4968	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.4E+01	1.8E+02	1.3E+02	8.7E+01	5.6E+01	2.6E+01
	2.9E+00	5.0E-01	4.1E-01	2.9E-01	1.3E-01	3.9E-02
	3.9E-02	2.6E-02	3.9E-02			
1922 4272	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.0E+01	1.6E+02	1.4E+02	1.1E+02	8.4E+01	4.4E+01
	4.8E+00	8.2E-01	5.6E-01	2.2E-01	1.6E-01	1.6E-01
	1.0E-01	9.1E-02	1.3E-02			
1923 3442	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	1.1E+02	1.3E+02	1.5E+02	1.4E+02	9.4E+01
	1.6E+01	2.4E+00	1.2E+00	9.4E-01	2.6E-01	2.1E-01
	1.3E-01	1.7E-01	1.2E-01			
1924 2157	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.3E+00	7.4E+01	1.3E+02	1.8E+02	1.4E+01	1.6E+02
	3.5E+01	1.1E+01	6.0E+00	3.7E+00	9.6E-01	4.6E-01
	4.2E-01	5.5E-01	3.8E-01			
1925 1823	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.8E+00	7.5E+01	1.4E+02	1.9E+02	2.4E+01	1.7E+02
	4.4E+01	1.5E+01	9.0E+00	5.1E+00	1.2E+00	4.2E-01
	4.6E-01	3.1E-01	1.6E-01			
1926 1578	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+00	8.3E+01	1.5E+02	2.0E+02	3.2E+01	1.6E+02
	4.3E+01	1.8E+01	1.1E+01	5.7E+00	1.2E+00	6.5E-01
	4.8E-01	3.1E-01	3.4E-01			
1927 1308	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	8.7E+01	1.5E+02	5.3E+00	3.5E+01	1.7E+02
	4.8E+01	2.1E+01	1.2E+01	6.1E+00	1.2E+00	5.6E-01
	5.6E-01	4.3E-01	3.4E-01			
1928 913	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+00	8.1E+01	1.5E+02	7.1E+00	4.0E+01	1.8E+02
	5.7E+01	2.7E+01	1.6E+01	8.1E+00	1.8E+00	1.2E+00
	7.7E-01	6.0E-01	5.1E-01			
1929 666	2.6E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.5E+00	7.0E+01	1.3E+02	1.2E+00	7.7E+01	2.0E+01
	9.2E+01	4.1E+01	2.5E+01	1.3E+01	4.9E+00	3.4E+00
	2.7E+00	2.6E+00	1.7E+00			
1930 581	6.1E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.9E+00	6.7E+01	1.3E+02	2.0E+02	6.2E+01	2.0E+01
	9.1E+01	4.2E+01	2.7E+01	1.4E+01	6.5E+00	4.4E+00
	3.7E+00	3.2E+00	2.8E+00			
1931 604	8.2E-02	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.2E+00	6.3E+01	1.2E+02	1.8E+02	3.7E+01	7.9E+00
	8.1E+01	4.0E+01	2.6E+01	1.4E+01	5.7E+00	4.4E+00
	3.7E+00	3.1E+00	2.6E+00			

1932 716	3.0E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.4E+00	6.5E+01	1.2E+02	1.7E+02	2.6E+00	1.8E+02
	7.4E+01	3.9E+01	2.6E+01	1.5E+01	5.3E+00	3.2E+00
	3.0E+00	2.6E+00	2.3E+00			
1933 894	2.7E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.0E+00	6.0E+01	1.1E+02	1.6E+02	2.0E+02	1.7E+02
	7.3E+01	4.4E+01	2.8E+01	1.4E+01	4.9E+00	3.6E+00
	3.2E+00	2.9E+00	2.3E+00			
1934 1186	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+00	6.7E+01	1.1E+02	1.6E+02	1.9E+02	1.5E+02
	6.4E+01	3.7E+01	2.2E+01	1.1E+01	2.3E+00	1.7E+00
	1.4E+00	1.2E+00	1.0E+00			
1935 1160	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	6.7E+01	1.1E+02	1.5E+02	1.7E+02	1.4E+02
	6.2E+01	3.5E+01	2.2E+01	1.2E+01	2.7E+00	1.6E+00
	1.0E+00	9.4E-01	9.1E-01			
1936 1060	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.6E+00	6.5E+01	1.1E+02	1.4E+02	1.7E+02	1.4E+02
	5.6E+01	3.4E+01	2.2E+01	1.1E+01	2.3E+00	1.7E+00
	1.2E+00	1.0E+00	1.0E+00			
1937 1164	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.2E+00	6.3E+01	1.1E+02	1.4E+02	1.7E+02	1.4E+02
	6.4E+01	3.9E+01	2.4E+01	1.2E+01	3.1E+00	2.0E+00
	1.5E+00	1.3E+00	1.3E+00			
1938 1408	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.8E+00	6.8E+01	1.1E+02	1.5E+02	1.7E+02	1.2E+02
	4.7E+01	2.7E+01	1.6E+01	7.6E+00	1.2E+00	6.8E-01
	5.2E-01	4.8E-01	4.3E-01			
1939 1335	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	6.9E+01	1.1E+02	1.4E+02	1.6E+02	1.3E+02
	5.3E+01	3.2E+01	1.9E+01	8.1E+00	1.6E+00	8.3E-01
	5.7E-01	6.4E-01	5.9E-01			
1940 1379	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.9E+00	6.9E+01	1.1E+02	1.4E+02	1.6E+02	1.3E+02
	5.2E+01	3.1E+01	1.9E+01	8.9E+00	1.8E+00	9.6E-01
	7.8E-01	6.6E-01	5.1E-01			
1941 1250	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	6.9E+01	1.1E+02	1.4E+02	1.6E+02	1.2E+02
	5.3E+01	3.2E+01	2.0E+01	9.0E+00	1.9E+00	1.3E+00
	1.0E+00	9.0E-01	7.0E-01			
1942 1105	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+00	7.1E+01	1.2E+02	1.4E+02	1.6E+02	1.2E+02
	6.8E+01	4.0E+01	2.4E+01	9.3E+00	2.6E+00	1.6E+00
	1.3E+00	1.1E+00	1.3E+00			
1943 1034	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.0E+00	7.6E+01	1.2E+02	1.5E+02	1.7E+02	1.2E+02
	7.1E+01	4.2E+01	2.5E+01	9.4E+00	2.0E+00	1.6E+00
	1.5E+00	1.3E+00	1.1E+00			
1944 661	1.7E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.7E+00	7.5E+01	1.2E+02	1.5E+02	1.6E+02	1.2E+02
	7.5E+01	4.3E+01	2.7E+01	8.9E+00	2.6E+00	2.2E+00
	1.9E+00	1.5E+00	1.3E+00			

Fog 3A. August 3 (Day 215) 1975

DAY 215 NUMBER DENSITY (NO./CC/MICRON)

1945 493	3.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.9E+00	7.9E+01	1.2E+02	1.5E+02	1.6E+02	1.3E+02
	7.7E+01	4.8E+01	3.0E+01	1.1E+01	2.9E+00	2.1E+00
	2.0E+00	1.3E+00	1.2E+00			
1946 582	1.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.4E+00	7.2E+01	1.2E+02	1.5E+02	1.7E+02	1.3E+02
	8.3E+01	5.4E+01	3.5E+01	1.3E+01	3.6E+00	2.3E+00
	2.0E+00	1.4E+00	1.4E+00			
1947 661	6.7E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.5E+00	8.1E+01	1.2E+02	1.5E+02	1.7E+02	1.2E+02
	8.2E+01	5.0E+01	2.8E+01	6.7E+00	2.9E+00	2.1E+00
	2.1E+00	1.5E+00	1.1E+00			
1948 799	6.4E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+00	7.2E+01	1.1E+02	1.4E+02	1.7E+02	1.3E+02
	8.2E+01	5.2E+01	3.1E+01	1.1E+01	3.3E+00	2.6E+00
	2.4E+00	1.9E+00	1.2E+00			
1949 801	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.0E+00	7.2E+01	1.1E+02	1.4E+02	1.7E+02	1.3E+02
	8.1E+01	5.2E+01	3.3E+01	1.2E+01	3.5E+00	2.6E+00
	2.0E+00	1.6E+00	1.2E+00			
1950 741	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.7E+00	7.1E+01	1.1E+02	1.4E+02	1.6E+02	1.3E+02
	8.4E+01	5.4E+01	3.0E+01	1.3E+01	4.2E+00	3.5E+00
	2.4E+00	2.1E+00	1.6E+00			
1951 677	3.5E-02	0.0E-01	1.3E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	7.4E+01	1.1E+02	1.4E+02	1.7E+02	1.2E+02
	8.1E+01	5.1E+01	3.0E+01	1.2E+01	4.2E+00	3.5E+00
	2.6E+00	2.2E+00	1.7E+00			
1952 992	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.1E+00	8.5E+01	1.2E+02	1.5E+02	1.6E+02	1.2E+02
	7.8E+01	4.8E+01	2.9E+01	9.1E+00	1.9E+00	1.1E+00
	9.6E-01	7.5E-01	4.4E-01			
1953 825	3.7E-02	4.1E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	8.1E+01	1.2E+02	1.4E+02	1.7E+02	1.3E+02
	8.1E+01	5.6E+01	3.4E+01	1.3E+01	1.9E+00	1.6E+00
	1.4E+00	9.2E-01	7.9E-01			
1954 720	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.1E+00	7.8E+01	1.2E+02	1.5E+02	1.7E+02	1.4E+02
	9.5E+01	5.8E+01	3.6E+01	1.5E+01	2.8E+00	2.0E+00
	1.6E+00	1.3E+00	9.4E-01			
1955 1665	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.2E+00	9.1E+01	1.3E+02	1.7E+02	1.8E+02	9.7E+01
	3.5E+01	2.0E+01	1.1E+01	2.8E+00	3.1E-01	9.1E-02
	1.0E-01	6.5E-02	2.6E-02			
1956 1286	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	9.6E+01	1.4E+02	1.7E+02	1.8E+02	1.0E+02
	5.0E+01	2.8E+01	1.6E+01	3.2E+00	5.3E-01	3.6E-01
	2.2E-01	1.7E-01	1.0E-01			
1957 904	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	9.6E+01	1.4E+02	1.8E+02	1.9E+02	1.3E+02
	6.2E+01	3.7E+01	2.1E+01	7.3E+00	1.3E+00	9.2E-01
	8.3E-01	4.3E-01	3.3E-01			

1958 433	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	1.0E+02	1.7E+02	5.4E+01	9.4E+01	1.9E+01
	8.5E+01	4.1E+01	2.4E+01	1.1E+01	3.3E+00	2.6E+00
	1.9E+00	1.7E+00	1.4E+00			
1959 498	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	8.9E+01	1.5E+02	2.6E+01	6.2E+01	1.8E+02
	7.7E+01	4.3E+01	2.7E+01	1.1E+01	5.5E+00	4.2E+00
	3.6E+00	3.4E+00	2.6E+00			
2000 670	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	9.7E+01	1.6E+02	5.0E+00	3.6E+01	1.7E+02
	7.4E+01	4.1E+01	2.5E+01	9.4E+00	2.6E+00	1.9E+00
	1.5E+00	1.2E+00	8.2E-01			
2001 2208	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	9.1E+01	1.2E+02	1.6E+02	1.7E+02	9.7E+01
	1.3E+01	6.2E+00	3.3E+00	1.3E+00	2.1E-01	1.6E-01
	1.4E-01	1.0E-01	6.5E-02			
2002 3368	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	1.0E+02	1.2E+02	1.3E+02	1.3E+02	6.3E+01
	3.5E+00	1.0E+00	3.6E-01	2.0E-01	1.2E-01	1.3E-01
	7.8E-02	7.8E-02	5.2E-02			
2003 2937	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.0E+02	1.2E+02	1.3E+02	1.3E+02	7.0E+01
	1.1E+01	5.1E+00	2.9E+00	1.3E+00	3.0E-01	3.0E-01
	2.2E-01	2.6E-01	1.6E-01			
2004 608	4.3E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.3E+00	7.0E+01	1.1E+02	1.3E+02	1.5E+02	1.3E+02
	6.7E+01	4.1E+01	2.5E+01	1.3E+01	2.3E+00	8.6E-01
	7.4E-01	7.4E-01	3.6E-01			
2005 384	6.3E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	6.7E+01	1.1E+02	1.3E+02	1.5E+02	1.3E+02
	9.3E+01	5.9E+01	3.7E+01	1.7E+01	4.7E+00	2.2E+00
	1.7E+00	1.4E+00	1.2E+00			
2006 351	5.2E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	6.7E+01	1.1E+02	1.3E+02	1.6E+02	1.5E+02
	9.2E+01	5.9E+01	3.8E+01	2.0E+01	5.4E+00	2.1E+00
	2.2E+00	1.3E+00	1.3E+00			
2007 312	5.2E-01	3.8E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	7.1E+01	1.0E+02	1.3E+02	1.5E+02	1.3E+02
	8.4E+01	5.3E+01	3.4E+01	1.7E+01	4.9E+00	3.3E+00
	2.3E+00	1.8E+00	1.4E+00			
2008 258	7.1E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	6.8E+01	9.8E+01	1.2E+02	1.3E+02	1.2E+02
	7.2E+01	4.5E+01	3.0E+01	1.5E+01	4.0E+00	3.0E+00
	2.5E+00	2.1E+00	1.4E+00			
2009 238	1.4E+00	3.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	7.0E+01	1.0E+02	1.2E+02	1.3E+02	1.2E+02
	6.6E+01	4.2E+01	2.6E+01	1.3E+01	3.5E+00	2.2E+00
	1.9E+00	2.0E+00	1.0E+00			
2010 203	1.2E+00	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	7.1E+01	1.0E+02	1.2E+02	1.3E+02	1.2E+02
	6.7E+01	4.2E+01	2.6E+01	1.3E+01	4.5E+00	2.6E+00
	2.4E+00	1.7E+00	1.2E+00			
2011 206	1.1E+00	7.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	7.2E+01	1.0E+02	1.2E+02	1.3E+02	1.1E+02
	6.5E+01	4.0E+01	2.5E+01	1.2E+01	3.9E+00	2.3E+00
	2.2E+00	1.6E+00	1.3E+00			

0207 1108	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	1.6E+02	1.8E+02	1.9E+02	1.8E+02	1.4E+02
	4.9E+01	2.8E+01	1.9E+01	9.5E+00	2.7E+00	1.3E+00
	1.4E+00	1.3E+00	7.2E-01			
0208 2904	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01

2012	279	3.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.4E+01	7.6E+01	1.1E+02	1.3E+02	1.3E+02	1.1E+02
		6.4E+01	3.8E+01	2.3E+01	1.3E+01	4.1E+00	2.3E+00
		2.2E+00	1.4E+00	9.9E-01			
2013	328	1.7E-01	3.7E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.4E+01	8.4E+01	1.1E+02	1.3E+02	1.3E+02	1.1E+02
		6.3E+01	3.7E+01	2.2E+01	1.3E+01	3.6E+00	1.8E+00
		1.8E+00	1.1E+00	9.2E-01			
2014	335	2.1E-01	3.8E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.3E+01	8.6E+01	1.1E+02	1.4E+02	1.4E+02	1.2E+02
		6.8E+01	3.9E+01	2.4E+01	1.2E+01	3.8E+00	1.5E+00
		1.1E+00	1.0E+00	6.1E-01			
2015	383	6.9E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.5E+01	8.8E+01	1.2E+02	1.4E+02	1.5E+02	1.2E+02
		6.7E+01	4.1E+01	2.4E+01	1.1E+01	3.1E+00	1.5E+00
		1.4E+00	9.2E-01	6.2E-01			
2016	394	3.5E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.7E+01	9.4E+01	1.2E+02	1.5E+02	1.6E+02	1.2E+02
		6.9E+01	4.1E+01	2.5E+01	1.1E+01	2.9E+00	1.8E+00
		1.4E+00	1.0E+00	8.1E-01			
2017	398	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.5E+01	9.5E+01	1.2E+02	1.4E+02	1.4E+02	1.1E+02
		6.5E+01	4.0E+01	2.3E+01	7.7E+00	3.1E+00	2.2E+00
		1.7E+00	1.3E+00	8.9E-01			
2018	422	7.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.6E+01	9.5E+01	1.1E+02	1.4E+02	1.4E+02	9.3E+01
		6.3E+01	3.6E+01	2.0E+01	5.8E+00	3.3E+00	2.3E+00
		2.0E+00	1.5E+00	1.1E+00			
2019	409	0.0E-01	3.7E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.4E+01	9.8E+01	1.2E+02	1.5E+02	1.6E+02	1.0E+02
		6.5E+01	3.9E+01	2.1E+01	6.4E+00	4.0E+00	2.6E+00
		2.2E+00	1.8E+00	1.4E+00			
2020	417	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.6E+01	1.0E+02	1.1E+02	1.5E+02	1.5E+02	9.9E+01
		6.6E+01	3.8E+01	2.0E+01	6.7E+00	5.2E+00	3.2E+00
		2.7E+00	2.2E+00	1.3E+00			
2021	531	3.4E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		2.4E+01	1.2E+02	1.3E+02	1.6E+02	1.6E+02	9.6E+01
		6.7E+01	3.5E+01	1.7E+01	5.9E+00	4.6E+00	3.1E+00
		2.4E+00	1.5E+00	7.4E-01			
2022	503	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		2.1E+01	1.1E+02	1.3E+02	1.8E+02	1.8E+02	1.2E+02
		7.5E+01	3.9E+01	1.9E+01	7.4E+00	5.1E+00	3.8E+00
		2.4E+00	1.7E+00	6.5E-01			
2023	559	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.7E+01	1.0E+02	1.3E+02	1.7E+02	1.8E+02	1.2E+02
		8.0E+01	4.4E+01	2.3E+01	7.8E+00	5.0E+00	3.8E+00
		2.3E+00	1.6E+00	6.9E-01			
2024	786	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.7E+01	9.8E+01	1.2E+02	1.6E+02	1.7E+02	1.1E+02
		8.3E+01	4.5E+01	2.1E+01	4.7E+00	1.5E+00	1.2E+00
		7.8E-01	4.6E-01	1.3E-01			
2025	783	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		2.0E+01	1.1E+02	1.2E+02	1.6E+02	1.6E+02	9.8E+01
		7.6E+01	4.0E+01	1.7E+01	2.1E+00	5.7E-01	2.7E-01
		1.2E-01	2.6E-02	2.6E-02			

Fog 4A. August 3 (Day 215) 1975

DAY 215 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

2026 686	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.1E+02	1.4E+02	1.8E+02	1.8E+02	1.2E+02
	8.0E+01	4.3E+01	2.2E+01	4.2E+00	7.9E-01	2.1E-01
	1.0E-01	3.9E-02	1.3E-02			
2027 639	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	1.1E+02	1.4E+02	1.9E+02	4.3E+00	1.4E+02
	9.4E+01	5.1E+01	2.5E+01	5.6E+00	1.2E+00	3.8E-01
	2.2E-01	7.8E-02	5.2E-02			
2028 552	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	8.6E+01	1.3E+02	1.9E+02	2.4E+01	1.7E+02
	1.1E+02	5.9E+01	3.3E+01	8.8E+00	1.9E+00	8.7E-01
	5.3E-01	4.6E-01	1.2E-01			
2029 737	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	1.1E+02	1.5E+02	2.0E+02	8.0E+00	1.5E+02
	9.2E+01	5.1E+01	3.0E+01	9.3E+00	1.8E+00	7.4E-01
	2.6E-01	3.0E-01	2.6E-01			
2030 930	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.1E+02	1.5E+02	1.9E+02	7.7E-01	1.5E+02
	7.8E+01	4.3E+01	2.5E+01	9.4E+00	1.4E+00	4.0E-01
	2.0E-01	2.1E-01	6.5E-02			
2031 675	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.5E+01	1.3E+02	1.7E+02	1.9E+02	2.0E+02	1.5E+02
	8.1E+01	4.8E+01	2.8E+01	1.2E+01	1.5E+00	5.3E-01
	1.6E-01	9.1E-02	6.5E-02			
2032 778	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+01	1.2E+02	1.6E+02	2.0E+02	4.5E+00	1.5E+02
	9.0E+01	5.1E+01	3.0E+01	1.3E+01	2.8E+00	5.9E-01
	2.9E-01	1.8E-01	7.8E-02			
2033 644	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.6E+01	9.8E+01	1.4E+02	2.0E+02	2.6E+01	1.7E+02
	1.0E+02	6.0E+01	3.5E+01	1.4E+01	2.2E+00	7.3E-01
	2.2E-01	1.0E-01	9.1E-02			
2034 791	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.6E+01	1.0E+02	1.4E+02	1.9E+02	2.0E+00	1.6E+02
	1.0E+02	5.9E+01	3.5E+01	1.4E+01	2.0E+00	7.4E-01
	4.0E-01	1.8E-01	5.2E-02			
2035 895	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.1E+02	1.3E+02	1.5E+02	1.6E+02	1.2E+02
	8.5E+01	5.0E+01	3.0E+01	6.8E+00	1.2E+00	4.6E-01
	2.1E-01	1.2E-01	9.1E-02			
2036 634	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.3E+02	1.5E+02	1.8E+02	1.8E+02	1.2E+02
	8.6E+01	4.6E+01	2.1E+01	2.9E+00	6.5E-01	1.8E-01
	1.8E-01	7.8E-02	1.3E-02			
2037 539	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	9.9E+01	1.4E+02	1.8E+01	4.1E+01	1.7E+02
	1.0E+02	5.5E+01	2.9E+01	6.6E+00	1.3E+00	4.4E-01
	1.4E-01	7.8E-02	9.1E-02			
2038 868	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.2E+02	1.5E+02	2.0E+02	2.0E+02	1.3E+02
	8.2E+01	4.3E+01	2.5E+01	6.0E+00	7.0E-01	2.9E-01
	1.2E-01	1.0E-01	3.9E-02			
2039 1200	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+01	1.2E+02	1.4E+02	1.7E+02	1.7E+02	1.1E+02
	5.6E+01	3.1E+01	1.8E+01	4.3E+00	3.4E-01	2.0E-01
	5.2E-02	5.2E-02	5.2E-02			

2040 2006	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.0E+01	1.3E+02	1.4E+02	1.7E+02	1.5E+02	8.1E+01
	2.4E+01	1.1E+01	6.0E+00	1.5E+00	1.6E-01	6.5E-02
	3.9E-02	7.8E-02	0.0E-01			
2041 2397	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	1.1E+02	1.3E+02	1.8E+02	1.7E+02	9.5E+01
	1.4E+01	5.6E+00	2.8E+00	9.6E-01	1.4E-01	5.2E-02
	7.8E-02	2.6E-02	1.3E-02			
2042 2697	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	9.4E+01	1.2E+02	1.6E+02	1.6E+02	9.0E+01
	8.9E+00	2.1E+00	8.4E-01	3.0E-01	7.8E-02	1.0E-01
	3.9E-02	3.9E-02	2.6E-02			
2043 2982	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.5E+01	1.0E+02	1.2E+02	1.5E+02	1.4E+02	7.3E+01
	5.6E+00	1.1E+00	5.3E-01	2.3E-01	1.3E-02	2.6E-02
	2.6E-02	1.3E-02	2.6E-02			
2044 2885	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.0E+01	1.1E+02	1.3E+02	1.5E+02	1.4E+02	7.3E+01
	5.9E+00	1.2E+00	3.6E-01	2.0E-01	3.9E-02	2.6E-02
	6.5E-02	3.9E-02	1.3E-02			
2045 2778	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.1E+01	1.1E+02	1.2E+02	1.5E+02	1.4E+02	6.6E+01
	6.0E+00	1.3E+00	4.9E-01	2.1E-01	5.2E-02	2.6E-02
	6.5E-02	5.2E-02	1.3E-02			
2046 2762	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	9.5E+01	1.2E+02	1.6E+02	1.4E+02	6.4E+01
	5.0E+00	1.4E+00	5.3E-01	1.0E-01	7.8E-02	7.8E-02
	3.9E-02	1.3E-02	2.6E-02			
2047 2859	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	9.2E+01	1.1E+02	1.6E+02	1.4E+02	7.8E+01
	6.3E+00	1.6E+00	8.4E-01	4.2E-01	1.0E-01	5.2E-02
	0.0E-01	1.3E-02	2.6E-02			
2048 2921	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	8.7E+01	1.1E+02	1.5E+02	1.4E+02	7.9E+01
	6.8E+00	1.6E+00	6.4E-01	2.2E-01	7.8E-02	1.0E-01
	0.0E-01	1.3E-02	2.6E-02			
2049 2418	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	7.9E+01	1.1E+02	1.5E+02	1.6E+02	8.6E+01
	7.2E+00	2.6E+00	8.8E-01	2.7E-01	1.3E-01	6.5E-02
	5.2E-02	3.9E-02	5.2E-02			
2050 2554	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	8.0E+01	1.2E+02	1.6E+02	1.8E+02	1.1E+02
	1.5E+01	6.4E+00	3.1E+00	1.1E+00	1.8E-01	7.8E-02
	2.6E-02	5.2E-02	1.3E-02			
2051 2584	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	8.2E+01	1.2E+02	1.6E+02	1.7E+02	9.8E+01
	1.2E+01	5.1E+00	2.7E+00	9.4E-01	1.4E-01	1.2E-01
	7.8E-02	6.5E-02	2.6E-02			
2052 2208	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	9.9E+01	1.3E+02	1.8E+02	1.7E+02	9.7E+01
	1.5E+01	6.9E+00	3.5E+00	1.2E+00	1.2E-01	5.2E-02
	5.2E-02	6.5E-02	0.0E-01			
2053 2451	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	9.4E+01	1.3E+02	1.7E+02	1.7E+02	9.2E+01
	2.0E+01	8.6E+00	4.9E+00	1.5E+00	2.0E-01	6.5E-02
	3.9E-02	5.2E-02	3.9E-02			

2054 2410	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	9.0E+01	1.2E+02	1.7E+02	1.7E+02	9.4E+01
	1.5E+01	6.6E+00	3.7E+00	1.0E+00	1.6E-01	6.5E-02
	7.8E-02	6.5E-02	2.6E-02			
2055 2733	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	8.5E+01	1.2E+02	1.6E+02	1.7E+02	9.4E+01
	1.5E+01	6.2E+00	2.9E+00	1.1E+00	1.3E-01	3.9E-02
	7.8E-02	1.3E-02	0.0E-01			
2056 2531	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	7.5E+01	1.1E+02	1.7E+02	1.8E+02	1.1E+02
	1.2E+01	4.0E+00	2.1E+00	7.9E-01	1.0E-01	2.6E-02
	7.8E-02	1.2E-01	1.3E-02			
2057 2334	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	8.4E+01	1.3E+02	1.7E+02	1.8E+02	1.1E+02
	1.9E+01	8.9E+00	4.8E+00	1.5E+00	1.6E-01	9.1E-02
	9.1E-02	3.9E-02	3.9E-02			
2058 2614	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	9.0E+01	1.2E+02	1.7E+02	1.9E+02	1.0E+02
	1.9E+01	8.6E+00	4.2E+00	1.3E+00	1.6E-01	1.6E-01
	7.8E-02	2.6E-02	6.5E-02			
2059 2126	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.6E+00	7.4E+01	1.2E+02	1.7E+02	1.9E+02	1.1E+02
	1.5E+01	5.6E+00	2.7E+00	8.7E-01	1.0E-01	7.8E-02
	7.8E-02	5.2E-02	6.5E-02			
2100 1254	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	9.0E+01	1.3E+02	1.7E+02	1.8E+02	1.2E+02
	5.6E+01	3.2E+01	1.8E+01	5.5E+00	6.5E-01	1.8E-01
	7.8E-02	7.8E-02	5.2E-02			
2101 700	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	9.5E+01	1.4E+02	1.8E+02	2.0E+02	1.4E+02
	8.5E+01	4.9E+01	2.8E+01	8.1E+00	1.1E+00	3.9E-01
	2.3E-01	1.8E-01	6.5E-02			
2102 2511	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	7.4E+01	1.2E+02	1.7E+02	4.6E+00	1.5E+02
	4.8E+01	2.7E+01	1.5E+01	4.8E+00	1.5E+00	9.1E-01
	8.1E-01	4.6E-01	2.9E-01			
2103 3007	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.8E+00	6.4E+01	1.1E+02	1.6E+02	1.9E+02	1.4E+02
	2.0E+01	7.4E+00	3.9E+00	1.9E+00	2.2E-01	1.0E-01
	1.2E-01	6.5E-02	5.2E-02			
2104 3140	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.6E+00	6.5E+01	1.1E+02	1.5E+02	1.8E+02	1.3E+02
	2.5E+01	8.9E+00	4.9E+00	2.0E+00	3.5E-01	1.4E-01
	1.7E-01	1.6E-01	0.0E-01			
2105 1679	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.8E+00	8.6E+01	1.3E+02	1.7E+02	1.9E+02	1.2E+02
	5.1E+01	3.0E+01	1.7E+01	6.2E+00	5.6E-01	3.5E-01
	1.0E-01	1.6E-01	6.5E-02			
2106 2001	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+01	7.1E+01	1.2E+02	1.9E+02	3.3E+01	1.6E+02
	9.0E+01	5.3E+01	3.1E+01	1.0E+01	4.9E+00	3.4E+00
	2.9E+00	2.1E+00	9.5E-01			
2107 2326	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.5E+00	7.5E+01	1.2E+02	1.7E+02	2.0E+02	1.5E+02
	8.2E+01	4.9E+01	3.0E+01	1.2E+01	5.2E+00	4.2E+00
	3.3E+00	2.5E+00	1.7E+00			

2108 3095	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.8E+00	6.5E+01	1.1E+02	1.6E+02	2.0E+02	1.2E+02
	1.9E+01	9.8E+00	5.3E+00	1.7E+00	2.6E-01	1.6E-01
	1.7E-01	1.4E-01	5.2E-02			
2109 3213	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+00	7.0E+01	1.1E+02	1.6E+02	1.9E+02	1.1E+02
	9.1E+00	2.9E+00	1.1E+00	2.3E-01	1.2E-01	9.1E-02
	3.9E-02	2.6E-02	5.2E-02			
2110 3916	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	9.7E+01	1.2E+02	1.4E+02	1.4E+02	6.8E+01
	4.7E+00	1.3E+00	6.9E-01	2.3E-01	9.1E-02	3.9E-02
	1.0E-01	5.2E-02	3.9E-02			
2111 4329	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.4E+01	1.4E+02	1.2E+02	8.7E+01	6.0E+01	2.1E+01
	9.5E-01	5.5E-01	1.1E-01	1.0E-01	6.5E-02	5.2E-02
	2.6E-02	5.2E-02	2.6E-02			
2112 3672	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	1.4E+02	1.2E+02	9.1E+01	6.1E+01	1.9E+01
	8.1E-01	3.8E-01	8.4E-02	2.6E-02	6.5E-02	3.9E-02
	1.3E-02	3.9E-02	3.9E-02			
2113 3659	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.5E+01	1.4E+02	1.2E+02	9.3E+01	5.9E+01	1.4E+01
	7.9E-01	3.3E-01	1.7E-01	3.9E-02	3.9E-02	3.9E-02
	2.6E-02	5.2E-02	0.0E-01			
2114 4239	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.8E+01	1.4E+02	1.1E+02	7.5E+01	4.0E+01	6.2E+00
	4.3E-01	2.6E-01	1.8E-01	1.3E-02	6.5E-02	1.3E-02
	2.6E-02	2.6E-02	0.0E-01			
2115 4189	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.8E+01	1.6E+02	1.0E+02	6.5E+01	3.3E+01	4.6E+00
	6.3E-01	2.1E-01	1.3E-01	2.6E-02	2.6E-02	1.3E-02
	1.3E-02	1.3E-02	0.0E-01			
2116 4145	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	1.8E+02	1.1E+02	6.5E+01	3.1E+01	5.0E+00
	5.5E-01	2.0E-01	1.1E-01	0.0E-01	0.0E-01	1.3E-02
	1.3E-02	0.0E-01	0.0E-01			
2117 4338	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.4E+01	1.6E+02	9.8E+01	6.1E+01	2.9E+01	4.0E+00
	5.5E-01	3.8E-01	1.3E-01	3.9E-02	2.6E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2118 4924	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+01	1.4E+02	7.8E+01	4.4E+01	1.9E+01	2.0E+00
	5.9E-01	1.8E-01	7.0E-02	0.0E-01	3.9E-02	1.3E-02
	1.3E-02	1.3E-02	0.0E-01			
2119 4962	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.1E+01	1.2E+02	5.9E+01	3.0E+01	1.2E+01	1.1E+00
	4.3E-01	1.5E-01	7.0E-02	3.9E-02	1.3E-02	1.3E-02
	1.3E-02	0.0E-01	0.0E-01			
2120 5152	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+01	1.1E+02	5.8E+01	2.9E+01	9.9E+00	5.9E-01
	2.6E-01	2.0E-01	7.0E-02	6.5E-02	2.6E-02	2.6E-02
	2.6E-02	0.0E-01	0.0E-01			

Fog 2B. August 2 (Day 214) 1975

DAY 214	NUMBER DENSITY (NO./CC/MICRON)					
HOUR VSBY	1ST LINE = DAP	LINES 2,3&4 = ASSP				
2240 2943	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	1.1E+02	1.6E+02	2.1E+02	2.3E+02	1.7E+02
	2.9E+01	3.5E+00	1.3E+00	4.8E-01	2.5E-01	8.9E-02
	5.4E-02	1.8E-01	1.3E-01			
2241 3000	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	1.2E+02	1.6E+02	2.1E+02	2.1E+02	1.5E+02
	2.4E+01	2.6E+00	1.1E+00	5.2E-01	2.0E-01	1.3E-01
	1.1E-01	1.8E-02	3.6E-02			
2242 3014	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	1.2E+02	1.7E+02	2.1E+02	2.2E+02	1.5E+02
	2.7E+01	2.1E+00	1.2E+00	6.1E-01	1.4E-01	1.8E-02
	0.0E-01	7.2E-02	0.0E-01			
2243 3103	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+01	1.4E+02	1.7E+02	2.1E+02	2.0E+02	1.4E+02
	1.9E+01	2.1E+00	9.4E-01	5.0E-01	2.3E-01	1.4E-01
	7.2E-02	8.9E-02	7.2E-02			
2244 3047	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	1.2E+02	1.7E+02	2.1E+02	2.2E+02	1.5E+02
	2.2E+01	2.1E+00	1.2E+00	5.7E-01	1.6E-01	3.6E-02
	5.4E-02	7.2E-02	7.2E-02			
2245 2838	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+01	1.1E+02	1.6E+02	2.2E+02	2.3E+02	1.7E+02
	2.8E+01	3.0E+00	1.4E+00	9.5E-01	2.0E-01	1.8E-02
	1.4E-01	7.2E-02	3.6E-02			
2246 2657	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E+00	9.7E+01	1.6E+02	2.2E+02	2.5E+02	1.8E+02
	3.2E+01	4.1E+00	1.8E+00	8.8E-01	3.0E-01	1.4E-01
	7.2E-02	1.8E-02	3.6E-02			
2247 2135	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.9E+00	7.7E+01	1.4E+02	2.1E+02	2.6E+02	2.1E+02
	5.2E+01	9.6E+00	4.9E+00	2.8E+00	8.0E-01	2.3E-01
	2.5E-01	1.4E-01	8.9E-02			
2248 1735	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.1E+00	6.8E+01	1.4E+02	1.9E+02	2.4E+02	2.1E+02
	8.0E+01	2.7E+01	1.6E+01	9.2E+00	3.4E+00	3.6E-01
	2.0E-01	1.6E-01	1.6E-01			
2249 1216	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+00	6.2E+01	1.2E+02	1.7E+02	2.2E+02	2.1E+02
	1.1E+02	6.4E+01	4.1E+01	2.4E+01	8.9E+00	2.2E+00
	1.5E+00	1.3E+00	1.1E+00			
2250 1372	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.1E+00	5.9E+01	1.2E+02	1.6E+02	2.2E+02	2.1E+02
	1.2E+02	7.5E+01	4.6E+01	2.8E+01	1.0E+01	3.6E+00
	3.2E+00	1.9E+00	1.3E+00			
2251 1007	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.3E+00	4.8E+01	1.1E+02	1.6E+02	2.1E+02	2.1E+02
	1.4E+02	8.5E+01	5.5E+01	3.5E+01	1.5E+01	9.0E+00
	8.0E+00	6.0E+00	4.6E+00			
2252 1367	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+00	5.4E+01	1.2E+02	1.7E+02	2.3E+02	2.2E+02
	1.3E+02	8.2E+01	5.1E+01	2.8E+01	9.2E+00	4.0E+00
	3.2E+00	2.6E+00	2.2E+00			

2253 920	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.1E+00	5.3E+01	1.2E+02	1.7E+02	2.3E+02	2.1E+02
	1.3E+02	8.5E+01	5.3E+01	2.8E+01	9.7E+00	6.5E+00
	5.3E+00	4.3E+00	2.9E+00			
2254 1370	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.8E+00	6.4E+01	1.2E+02	1.7E+02	2.2E+02	2.0E+02
	1.3E+02	7.6E+01	4.9E+01	2.7E+01	1.1E+01	5.6E+00
	4.4E+00	4.1E+00	3.0E+00			
2255 1140	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.2E+00	6.6E+01	1.3E+02	1.8E+02	2.2E+02	2.1E+02
	1.1E+02	6.7E+01	4.2E+01	2.4E+01	7.2E+00	2.3E+00
	1.9E+00	1.3E+00	8.8E-01			
2256 967	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.9E+00	6.4E+01	1.3E+02	1.6E+02	2.0E+02	2.0E+02
	1.1E+02	7.3E+01	4.7E+01	2.7E+01	7.9E+00	4.3E+00
	2.9E+00	2.0E+00	2.1E+00			
2257 1228	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+00	7.3E+01	1.3E+02	1.7E+02	2.2E+02	2.0E+02
	9.9E+01	5.8E+01	3.7E+01	1.9E+01	4.7E+00	1.8E+00
	1.3E+00	8.8E-01	5.7E-01			
2258 1252	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.6E+00	7.8E+01	1.3E+02	1.9E+02	2.4E+02	2.0E+02
	7.8E+01	3.9E+01	2.4E+01	1.4E+01	2.9E+00	4.8E-01
	3.8E-01	4.8E-01	3.2E-01			
2259 1182	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.0E+00	6.5E+01	1.3E+02	1.8E+02	2.3E+02	2.1E+02
	8.9E+01	5.3E+01	3.3E+01	1.8E+01	4.5E+00	1.7E+00
	1.1E+00	7.2E-01	6.8E-01			
2300 948	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.2E+00	5.7E+01	1.2E+02	1.7E+02	2.3E+02	2.2E+02
	1.1E+02	6.9E+01	4.5E+01	2.4E+01	6.3E+00	2.9E+00
	2.7E+00	2.1E+00	1.7E+00			
2301 786	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.3E+00	5.1E+01	1.1E+02	1.6E+02	2.2E+02	2.2E+02
	1.3E+02	8.6E+01	5.5E+01	3.1E+01	1.1E+01	7.1E+00
	6.1E+00	4.6E+00	3.5E+00			
2302 717	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.9E+00	4.4E+01	9.8E+01	1.5E+02	2.1E+02	1.9E+02
	1.2E+02	7.4E+01	5.3E+01	3.5E+01	2.1E+01	2.2E+01
	1.9E+01	1.4E+01	1.3E+01			
2303 758	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.8E+00	4.1E+01	1.1E+02	1.7E+02	2.3E+02	2.2E+02
	1.3E+02	8.4E+01	5.6E+01	3.7E+01	1.8E+01	1.3E+01
	1.2E+01	9.8E+00	7.4E+00			
2304 735	3.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+00	4.8E+01	1.2E+02	1.8E+02	2.4E+02	2.0E+02
	1.2E+02	7.8E+01	5.2E+01	3.3E+01	1.9E+01	1.7E+01
	1.4E+01	1.2E+01	1.0E+01			
2305 729	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.8E+00	5.8E+01	1.3E+02	1.9E+02	2.5E+02	2.1E+02
	1.3E+02	8.0E+01	5.3E+01	3.1E+01	1.8E+01	1.5E+01
	1.3E+01	1.1E+01	9.4E+00			
2306 773	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.6E+00	5.3E+01	1.2E+02	1.8E+02	2.3E+02	2.1E+02
	1.2E+02	8.2E+01	5.7E+01	3.2E+01	1.8E+01	1.7E+01
	1.5E+01	1.2E+01	1.0E+01			

2307	[illegible]	[illegible]	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		4.8E+00	5.0E+01	1.2E+02	1.7E+02	2.3E+02	2.1E+02
		1.1E+02	7.4E+01	5.4E+01	[illegible]	1.9E+01	2.0E+01
		1.7E+01	1.5E+01	1.4E+01			
2308	504	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		4.8E+00	4.9E+01	1.1E+02	1.8E+02	2.3E+02	1.8E+02
		1.0E+02	6.9E+01	4.6E+01	2.4E+01	1.8E+01	1.7E+01
		1.7E+01	1.6E+01	1.5E+01			
2309	457	3.1E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.2E+00	4.0E+01	1.1E+02	1.7E+02	2.3E+02	1.9E+02
		1.0E+02	6.8E+01	4.6E+01	2.5E+01	1.4E+01	1.3E+01
		1.3E+01	1.3E+01	1.3E+01			
2310	407	3.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.0E+00	3.9E+01	1.1E+02	1.6E+02	2.2E+02	2.0E+02
		9.5E+01	6.5E+01	4.3E+01	2.6E+01	1.0E+01	9.9E+00
		9.9E+00	1.1E+01	1.1E+01			

2335	889	1.2E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.7E+00	4.4E+01	1.0E+02	1.7E+02	1.9E+02	8.3E+01
		4.7E+01	2.6E+01	1.3E+01	5.8E+00	5.5E+00	5.8E+00
		5.0E+00	4.9E+00	4.4E+00			
2336	951	7.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.7E+00	4.4E+01	9.9E+01	1.7E+02	1.9E+02	9.1E+01
		5.2E+01	3.0E+01	1.6E+01	5.8E+00	5.9E+00	5.6E+00
		5.1E+00	5.2E+00	4.7E+00			
2337	927	4.7E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.7E+00	4.5E+01	9.8E+01	1.6E+02	1.9E+02	9.6E+01
		5.4E+01	3.3E+01	1.8E+01	7.5E+00	6.7E+00	6.3E+00
		6.0E+00	6.0E+00	5.2E+00			
2338	854	1.1E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		4.0E+00	4.2E+01	9.2E+01	1.5E+02	1.8E+02	9.1E+01
		5.7E+01	3.3E+01	1.8E+01	8.8E+00	8.5E+00	8.5E+00
		8.0E+00	7.6E+00	6.9E+00			
2339	817	1.1E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		3.8E+00	4.7E+01	9.2E+01	1.6E+02	1.8E+02	8.1E+01
		5.1E+01	3.1E+01	1.7E+01	9.8E+00	9.5E+00	9.6E+00
		1.0E+01	9.4E+00	8.0E+00			
2340	840	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		4.1E+00	4.8E+01	9.8E+01	1.6E+02	1.7E+02	7.4E+01
		5.1E+01	3.0E+01	1.6E+01	1.1E+01	1.0E+01	9.3E+00
		8.9E+00	9.1E+00	8.1E+00			
2341	798	4.6E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		4.8E+00	4.9E+01	9.6E+01	1.6E+02	1.7E+02	7.6E+01
		5.6E+01	3.2E+01	1.6E+01	1.1E+01	1.1E+01	1.0E+01
		1.0E+01	9.4E+00	8.3E+00			
2342	803	2.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		5.7E+00	5.0E+01	9.9E+01	1.7E+02	1.6E+02	7.6E+01
		5.7E+01	3.1E+01	1.5E+01	1.2E+01	1.1E+01	1.0E+01
		9.7E+00	8.0E+00	7.0E+00			

2343 704	9.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.4E+00	5.1E+01	1.0E+02	1.7E+02	1.6E+02	7.3E+01
	5.5E+01	3.1E+01	1.3E+01	1.2E+01	1.1E+01	9.7E+00
	9.7E+00	8.2E+00	6.5E+00			
2344 803	9.6E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+00	5.4E+01	1.1E+02	1.7E+02	1.6E+02	7.5E+01
	6.0E+01	3.0E+01	1.4E+01	1.1E+01	1.1E+01	8.5E+00
	5.9E+00	7.8E+00	5.6E+00			
2345 832	4.6E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.9E+00	5.8E+01	1.1E+02	1.8E+02	1.7E+02	7.7E+01
	6.2E+01	2.9E+01	1.3E+01	9.9E+00	1.0E+01	8.9E+00
	7.5E+00	6.4E+00	5.2E+00			
2346 853	2.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.1E+00	6.2E+01	1.1E+02	1.8E+02	1.6E+02	8.2E+01
	6.5E+01	3.0E+01	1.2E+01	1.0E+01	1.0E+01	8.6E+00
	7.2E+00	6.0E+00	4.3E+00			
2347 877	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.6E+00	6.0E+01	1.1E+02	1.8E+02	1.6E+02	8.8E+01
	6.8E+01	3.1E+01	1.3E+01	1.1E+01	1.1E+01	8.8E+00
	7.0E+00	5.5E+00	4.4E+00			
2348 835	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.0E+00	5.6E+01	1.1E+02	1.8E+02	1.6E+02	8.8E+01
	7.0E+01	3.2E+01	1.4E+01	1.3E+01	1.1E+01	9.4E+00
	7.5E+00	5.8E+00	3.3E+00			
2349 811	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+00	6.1E+01	1.1E+02	1.8E+02	1.5E+02	8.5E+01
	7.0E+01	3.1E+01	1.6E+01	1.6E+01	1.3E+01	1.1E+01
	7.5E+00	5.6E+00	3.4E+00			
2350 853	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.1E+00	6.6E+01	1.2E+02	1.9E+02	1.6E+02	9.4E+01
	7.2E+01	3.2E+01	1.6E+01	1.4E+01	1.2E+01	8.9E+00
	6.0E+00	4.4E+00	1.9E+00			
2351 911	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.2E+00	7.8E+01	1.3E+02	9.2E+00	1.6E+02	9.2E+01
	6.9E+01	2.8E+01	1.2E+01	9.0E+00	6.9E+00	5.2E+00
	3.1E+00	1.9E+00	1.0E+00			
2352 1457	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	1.1E+02	1.7E+02	4.4E+01	1.6E+02	6.4E+01
	4.4E+01	1.6E+01	4.1E+00	2.9E+00	1.9E+00	1.5E+00
	7.5E-01	4.0E-01	1.4E-01			
2353 1808	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	1.5E+02	3.2E+01	6.3E+01	1.1E+02	2.3E+01
	1.3E+01	3.6E+00	4.8E-01	3.0E-01	2.7E-01	1.7E-01
	6.2E-02	6.2E-02	2.5E-02			
2354 2107	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.6E+01	1.5E+02	4.8E+01	4.5E+01	6.0E+01	1.6E+01
	7.7E+00	1.3E+00	2.6E-01	2.0E-01	1.0E-01	5.0E-02
	2.5E-02	5.0E-02	2.5E-02			
2355 2164	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	1.7E+02	5.6E+01	1.1E+01	2.8E+01	8.6E+00
	4.1E+00	3.2E-01	1.1E-01	1.1E-01	1.1E-01	5.0E-02
	3.7E-02	2.5E-02	3.7E-02			
2356 2178	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.8E+01	1.9E+02	5.2E+01	1.9E+02	1.5E+01	6.4E+00
	2.6E+00	2.6E-01	1.7E-01	1.2E-01	1.1E-01	2.5E-02
	0.0E-01	1.2E-02	0.0E-01			

2357 2256	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	1.7E+02	4.8E+01	1.5E+00	2.0E+01	7.2E+00
	3.3E+00	2.3E-01	1.3E-01	7.5E-02	8.7E-02	1.2E-02
	2.5E-02	2.5E-02	1.2E-02			
2358 2356	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.5E+01	1.7E+02	3.8E+01	5.7E+00	2.7E+01	7.0E+00
	2.9E+00	2.6E-01	2.2E-01	1.0E-01	1.4E-01	5.0E-02
	2.5E-02	2.5E-02	3.7E-02			
2359 2410	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+02	2.3E+02	4.6E+01	7.1E+00	3.7E+01	5.6E+00
	2.6E+00	6.7E-01	1.3E-01	1.2E-01	1.0E-01	5.0E-02
	1.2E-02	1.2E-02	2.5E-02			
0000 2626	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	2.1E+02	3.1E+01	1.8E+02	5.0E+01	5.1E+00
	2.6E+00	5.0E-01	9.4E-02	1.2E-01	5.0E-02	8.7E-02
	1.2E-02	1.2E-02	0.0E-01			

0014 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.2E+01	1.9E+02	1.9E+02	1.4E+02	3.1E+01	2.4E+00
	1.2E+00	1.7E-01	1.9E-01	8.7E-02	1.0E-01	3.7E-02
	3.7E-02	1.2E-02	0.0E-01			
0015 442	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.1E+01	1.4E+02	1.7E+02	1.5E+02	6.9E+01	3.8E+00
	1.5E+00	5.8E-01	1.6E-01	1.0E-01	6.2E-02	3.7E-02
	3.7E-02	2.5E-02	1.2E-02			
0016 429	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	1.3E+02	1.6E+02	1.6E+02	1.1E+02	6.6E+00
	1.7E+00	6.6E-01	1.9E-01	1.5E-01	8.7E-02	3.7E-02
	3.7E-02	2.5E-02	3.7E-02			

0029 3040	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.7E+01	1.8E+02	1.7E+02	1.5E+02	9.8E+01	1.6E+01
	1.9E+00	6.3E-01	3.8E-01	1.5E-01	1.0E-01	3.7E-02
	2.5E-02	7.5E-02	2.5E-02			
0030 3093	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.9E+01	1.8E+02	1.7E+02	1.6E+02	1.0E+02	1.0E+01
	1.7E+00	1.0E+00	2.7E-01	7.5E-02	1.1E-01	8.7E-02
	2.5E-02	3.7E-02	1.2E-02			
0031 3336	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	2.0E+02	1.7E+02	1.4E+02	8.4E+01	7.4E+00
	1.2E+00	5.1E-01	3.0E-01	7.5E-02	5.0E-02	6.2E-02
	2.5E-02	1.2E-02	0.0E-01			

0044 3805	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.2E+01	1.3E+02	8.2E+01	5.3E+01	2.2E+01	7.2E-01
	6.2E-01	2.8E-01	6.7E-02	1.0E-01	1.2E-02	2.5E-02
	1.2E-02	2.5E-02	0.0E-01			
0045 4637	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.0E+01	1.2E+02	9.2E+01	6.0E+01	3.2E+01	1.4E+00
	6.0E-01	3.5E-01	8.1E-02	0.0E-01	2.5E-02	5.0E-02
	2.5E-02	0.0E-01	2.5E-02			
0046 4305	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.7E+01	1.3E+02	8.3E+01	5.4E+01	2.8E+01	1.5E+00
	7.4E-01	2.3E-01	1.2E-01	3.7E-02	1.2E-02	6.2E-02
	1.2E-02	1.2E-02	1.2E-02			

0058 4665	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+01	1.4E+02	8.2E+01	5.1E+01	2.9E+01	9.2E+00
	6.0E-01	3.2E-01	2.2E-01	6.2E-02	1.2E-02	0.0E-01
	6.2E-02	2.5E-02	1.2E-02			
0059 4594	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.2E+01	1.3E+02	7.8E+01	4.9E+01	2.9E+01	8.3E+00
	5.4E-01	3.2E-01	6.7E-02	2.5E-02	1.2E-02	6.2E-02
	3.7E-02	1.2E-02	0.0E-01			
0100 4643	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+01	1.3E+02	8.4E+01	5.6E+01	3.4E+01	1.2E+01
	7.2E-01	2.5E-01	1.9E-01	7.5E-02	1.2E-02	1.2E-02
	0.0E-01	2.5E-02	0.0E-01			

Fog 3A. August 3 (Day 215) 1975

DAY 215 NUMBER DENSITY (NO./CC/MICRON)
HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

0140 4041	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+02	2.5E+02	1.5E+02	1.1E+02	6.9E+01	3.2E+01
	2.8E+00	6.5E-01	1.5E-01	4.7E-02	4.7E-02	7.0E-02
	0.0E-01	2.3E-02	7.0E-02			
0141 4012	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	2.4E+02	1.5E+02	1.1E+02	6.9E+01	2.6E+01
	2.1E+00	4.6E-01	4.0E-01	1.2E-01	4.7E-02	4.7E-02
	7.0E-02	0.0E-01	0.0E-01			
0142 3959	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.9E+01	2.2E+02	1.3E+02	9.8E+01	5.9E+01	2.2E+01
	1.2E+00	3.0E-01	2.8E-01	1.4E-01	1.2E-01	2.3E-02
	9.3E-02	0.0E-01	0.0E-01			
0143 4046	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.4E+01	2.0E+02	1.2E+02	9.0E+01	5.2E+01	1.8E+01
	7.6E-01	2.7E-01	1.3E-01	9.3E-02	0.0E-01	7.0E-02
	2.3E-02	0.0E-01	4.7E-02			
0144 4225	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.9E+01	2.1E+02	1.3E+02	8.1E+01	4.7E+01	1.6E+01
	8.0E-01	3.3E-01	2.3E-01	1.6E-01	7.0E-02	4.7E-02
	4.7E-02	2.3E-02	4.7E-02			
0145 3943	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E+01	2.2E+02	1.5E+02	1.1E+02	7.8E+01	3.4E+01
	2.1E+00	6.0E-01	2.5E-01	7.0E-02	4.7E-02	7.0E-02
	4.7E-02	0.0E-01	4.7E-02			
0146 3669	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.2E+01	2.3E+02	1.9E+02	1.8E+02	1.3E+02	7.0E+01
	4.5E+00	9.8E-01	7.0E-01	1.9E-01	7.0E-02	9.3E-02
	1.2E-01	9.3E-02	2.3E-02			
0147 3638	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.8E+01	2.3E+02	1.8E+02	1.7E+02	1.3E+02	6.4E+01
	3.8E+00	6.8E-01	4.3E-01	2.8E-01	0.0E-01	4.7E-02
	4.7E-02	9.3E-02	7.0E-02			
0148 3269	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.3E+01	2.0E+02	1.9E+02	2.0E+02	1.6E+02	9.6E+01
	8.4E+00	1.3E+00	5.5E-01	4.4E-01	9.3E-02	4.7E-02
	4.7E-02	4.7E-02	4.7E-02			
0149 2935	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	1.7E+02	2.0E+02	2.4E+02	2.3E+02	1.4E+02
	2.4E+01	2.8E+00	1.8E+00	1.0E+00	1.9E-01	1.9E-01
	1.4E-01	4.7E-02	4.7E-02			
0150 3215	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.3E+01	2.0E+02	1.9E+02	2.0E+02	1.[illegible]E+02	9.1E+01
	1.5E+01	1.8E+00	1.0E+00	3.5E-01	2.3E-01	9.3E-02
	4.7E-02	2.3E-02	9.3E-02			
0151 2762	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	1.6E+02	2.0E+02	2.5E+02	2.5E+02	1.6E+02
	3.4E+01	5.4E+00	2.7E+00	1.2E+00	5.1E-01	1.4E-01
	1.2E-01	7.0E-02	7.0E-02			
0152 2539	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	1.3E+02	1.9E+02	2.7E+02	2.9E+02	2.1E+02
	5.1E+01	1.4E+01	7.8E+00	4.6E+00	1.2E+00	1.6E-01
	1.4E-01	9.3E-02	9.3E-02			

0153 2729		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	2.4E+01	1.5E+02	2.0E+02	2.5E+02	2.6E+02	1.8E+02
		3.2E+01	6.1E+00	4.1E+00	1.8E+00	4.7E-01	9.3E-02
		7.0E-02	1.4E-01	2.3E-02			
0154 2810		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	3.6E+01	1.8E+02	1.9E+02	2.1E+02	1.9E+02	1.3E+02
		2.0E+01	2.6E+00	1.6E+00	7.0E-01	1.6E-01	9.3E-02
		7.0E-02	4.7E-02	2.3E-02			
0155 3135		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	3.8E+01	1.8E+02	1.8E+02	2.0E+02	1.8E+02	1.2E+02
		1.7E+01	2.1E+00	1.1E+00	8.4E-01	1.9E-01	1.4E-01
		0.0E-01	2.3E-02	4.7E-02			
0156 2946		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	2.9E+01	1.7E+02	1.9E+02	2.3E+02	2.2E+02	1.6E+02
		2.8E+01	4.0E+00	2.0E+00	1.2E+00	2.8E-01	1.4E-01
		9.3E-02	7.0E-02	0.0E-01			
0157 2511		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	2.0E+01	1.3E+02	1.8E+02	2.4E+02	2.7E+02	2.0E+02
		5.3E+01	2.0E+01	1.3E+01	7.6E+00	2.7E+00	1.4E+00
		1.4E+00	1.4E+00	1.2E+00			
0158 979		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	7.3E+00	8.4E+01	1.5E+02	2.0E+02	2.4E+02	2.2E+02
		1.1E+02	7.2E+01	4.6E+01	3.1E+01	1.3E+01	1.2E+01
		1.1E+01	9.3E+00	9.0E+00			
0159 751		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	7.8E+00	8.0E+01	1.5E+02	1.9E+02	2.3E+02	2.1E+02
		1.0E+02	6.6E+01	4.5E+01	2.6E+01	1.2E+01	1.1E+01
		1.1E+01	9.8E+00	1.0E+01			
0200 968		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	6.5E+00	8.7E+01	1.6E+02	2.0E+02	2.5E+02	2.0E+02
		9.3E+01	6.0E+01	4.2E+01	2.4E+01	1.1E+01	1.0E+01
		8.6E+00	8.5E+00	7.9E+00			
0201 757		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	7.6E+00	8.0E+01	1.5E+02	1.9E+02	2.3E+02	2.0E+02
		9.1E+01	5.7E+01	4.1E+01	2.5E+01	1.1E+01	1.0E+01
		1.0E+01	9.0E+00	8.5E+00			
0202 1023		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	6.2E+00	7.9E+01	1.5E+02	1.9E+02	2.3E+02	2.2E+02
		1.3E+02	8.3E+01	5.7E+01	3.3E+01	1.2E+01	6.7E+00
		5.8E+00	5.0E+00	4.1E+00			
0203 955		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	1.1E+01	9.4E+01	1.6E+02	2.0E+02	2.3E+02	2.1E+02
		1.1E+02	7.2E+01	4.9E+01	2.7E+01	9.6E+00	7.3E+00
		6.7E+00	5.8E+00	5.9E+00			
0204 1048		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	9.7E+00	1.0E+02	1.6E+02	2.0E+02	2.2E+02	1.9E+02
		9.4E+01	5.8E+01	4.1E+01	2.3E+01	8.3E+00	7.7E+00
		6.2E+00	6.2E+00	5.0E+00			
0205 962		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	1.6E+01	1.2E+02	1.8E+02	2.3E+02	2.5E+02	1.9E+02
		9.7E+01	5.6E+01	3.5E+01	1.7E+01	3.9E+00	2.9E+00
		3.0E+00	2.1E+00	1.9E+00			
0206 2637		0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	ASSP 4	5.0E+01	1.8E+02	1.8E+02	1.9E+02	1.6E+02	1.0E+02
		2.1E+01	1.1E+01	6.0E+00	3.5E+00	8.9E-01	3.3E-01
		3.7E-01	2.8E-01	2.8E-01			

0207 1108	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	1.6E+02	1.8E+02	1.9E+02	1.8E+02	1.4E+02
	4.9E+01	2.8E+01	1.9E+01	9.5E+00	2.7E+00	1.3E+00
	1.4E+00	1.3E+00	7.2E-01			
0208 2904	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+01	1.8E+02	1.8E+02	2.0E+02	1.6E+02	1.3E+02
	1.5E+01	3.6E+00	2.0E+00	8.9E-01	3.3E-01	7.0E-02
	7.0E-02	9.3E-02	4.7E-02			
0209 2610	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+01	1.5E+02	1.8E+02	2.3E+02	2.3E+02	1.7E+02
	4.0E+01	1.5E+01	1.0E+01	5.8E+00	1.4E+00	3.5E-01
	3.5E-01	1.4E-01	2.1E-01			
0210 3150	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.2E+01	1.6E+02	1.8E+02	2.3E+02	2.3E+02	1.6E+02
	3.0E+01	8.8E+00	5.3E+00	2.7E+00	4.7E-01	1.4E-01
	4.7E-02	9.3E-02	4.7E-02			
0211 3421	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	1.5E+02	1.7E+02	2.2E+02	2.2E+02	1.6E+02
	3.0E+01	7.9E+00	4.8E+00	2.4E+00	5.8E-01	9.3E-02
	7.0E-02	7.0E-02	7.0E-02			
0212 3197	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.8E+01	1.5E+02	1.7E+02	2.1E+02	2.1E+02	1.6E+02
	3.2E+01	5.6E+00	2.4E+00	1.6E+00	6.3E-01	7.0E-02
	9.3E-02	4.7E-02	4.7E-02			
0213 3816	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+01	1.8E+02	1.6E+02	1.5E+02	1.1E+02	7.5E+01
	1.2E+01	1.1E+00	5.3E-01	3.0E-01	1.6E-01	2.3E-02
	9.3E-02	0.0E-01	0.0E-01			
0214 3794	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.3E+01	1.9E+02	1.6E+02	1.5E+02	1.2E+02	8.0E+01
	1.5E+01	8.2E-01	7.5E-01	3.0E-01	2.6E-01	9.3E-02
	2.3E-02	9.3E-02	4.7E-02			
0215 3824	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.2E+01	1.9E+02	1.5E+02	1.4E+02	1.1E+02	7.0E+01
	1.5E+01	9.0E-01	7.3E-01	2.8E-01	4.7E-02	4.7E-02
	2.3E-02	9.3E-02	0.0E-01			
0216 3927	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.1E+01	1.9E+02	1.5E+02	1.3E+02	1.1E+02	6.0E+01
	1.4E+01	6.8E-01	5.8E-01	2.1E-01	1.2E-01	9.3E-02
	2.3E-02	2.3E-02	2.3E-02			
0217 4029	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+01	1.9E+02	1.4E+02	1.2E+02	9.2E+01	5.3E+01
	1.2E+01	8.7E-01	3.0E-01	2.8E-01	1.6E-01	4.7E-02
	4.7E-02	0.0E-01	0.0E-01			
0218 4343	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+01	1.9E+02	1.2E+02	9.9E+01	6.9E+01	3.6E+01
	5.8E+00	7.9E-01	1.5E-01	1.9E-01	7.0E-02	9.3E-02
	2.3E-02	2.3E-02	0.0E-01			
0219 4185	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+01	1.9E+02	1.2E+02	9.6E+01	6.2E+01	3.4E+01
	4.5E+00	4.1E-01	3.3E-01	1.2E-01	1.2E-01	9.3E-02
	0.0E-01	2.3E-02	0.0E-01			
0220 4248	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.0E+01	1.9E+02	1.2E+02	9.2E+01	6.1E+01	3.2E+01
	3.9E+00	4.1E-01	4.3E-01	2.8E-01	2.3E-02	2.3E-02
	7.0E-02	4.7E-02	4.7E-02			

Fog 4A. August 3 (Day 215) 1975

DAY 215 NUMBER DENSITY (NO./CC/MICRON)
HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

1520 8298	0.0E-01	0.0E-01	6.2E-04	9.8E-04	0.0E-01	3.2E-04
ASSP 4	1.9E+01	6.4E+01	4.0E+01	2.5E+01	1.8E+01	7.8E+00
	2.3E+00	1.4E+00	8.8E-01	4.9E-01	2.2E-01	9.3E-02
	1.1E-01	1.0E-01	7.4E-02			
1521 7992	0.0E-01	0.0E-01	1.2E-03	0.0E-01	6.5E-04	4.8E-04
ASSP 4	1.6E+01	6.8E+01	4.3E+01	2.7E+01	1.9E+01	8.1E+00
	2.6E+00	1.6E+00	1.1E+00	5.3E-01	3.2E-01	1.4E-01
	1.5E-01	1.3E-01	1.8E-01			
1522 7769	0.0E-01	0.0E-01	0.0E-01	0.0E-01	6.6E-04	4.9E-04
ASSP 4	1.7E+01	6.6E+01	4.6E+01	2.9E+01	2.0E+01	1.0E+01
	2.4E+00	1.8E+00	9.8E-01	5.8E-01	1.9E-01	1.5E-01
	1.5E-01	1.3E-01	1.4E-01			
1523 7317	0.0E-01	0.0E-01	0.0E-01	3.2E-04	1.3E-03	4.7E-04
ASSP 4	1.5E+01	6.9E+01	5.0E+01	3.2E+01	2.2E+01	1.1E+01
	2.8E+00	1.5E+00	1.0E+00	6.5E-01	3.4E-01	2.5E-01
	2.4E-01	1.2E-01	1.8E-01			
1524 7723	0.0E-01	0.0E-01	6.7E-04	3.5E-04	7.1E-04	7.0E-04
ASSP 4	1.6E+01	7.1E+01	5.2E+01	3.5E+01	2.5E+01	1.1E+01
	3.4E+00	1.7E+00	1.3E+00	5.9E-01	3.5E-01	2.1E-01
	1.9E-01	2.5E-01	1.0E-01			
1525 6952	0.0E-01	0.0E-01	4.5E-03	1.0E-03	1.2E-03	1.5E-03
ASSP 4	1.7E+01	7.4E+01	5.6E+01	3.8E+01	2.8E+01	1.4E+01
	3.1E+00	2.0E+00	1.3E+00	7.5E-01	3.8E-01	2.8E-01
	3.1E-01	1.6E-01	2.0E-01			
1526 6713	0.0E-01	0.0E-01	4.3E-03	1.5E-03	1.8E-03	1.7E-03
ASSP 4	1.5E+01	7.5E+01	6.2E+01	4.4E+01	3.3E+01	1.7E+01
	3.7E+00	2.1E+00	1.3E+00	7.4E-01	3.6E-01	2.6E-01
	2.8E-01	2.7E-01	2.0E-01			
1527 6446	0.0E-01	8.7E-03	2.8E-03	3.0E-03	1.5E-03	1.1E-03
ASSP 4	1.4E+01	7.5E+01	7.1E+01	5.5E+01	4.4E+01	2.3E+01
	4.0E+00	2.4E+00	1.5E+00	9.6E-01	4.5E-01	4.5E-01
	3.1E-01	4.1E-01	1.8E-01			
1528 5812	1.9E-02	4.1E-03	4.7E-03	3.5E-03	1.9E-03	7.0E-04
ASSP 4	1.2E+01	7.7E+01	7.8E+01	7.0E+01	5.8E+01	3.0E+01
	5.3E+00	2.5E+00	1.5E+00	1.1E+00	5.6E-01	4.2E-01
	3.2E-01	4.0E-01	2.7E-01			
1529 5735	0.0E-01	8.5E-03	6.2E-03	2.2E-03	2.9E-03	1.3E-03
ASSP 4	1.1E+01	7.6E+01	8.5E+01	7.9E+01	7.2E+01	3.7E+01
	6.1E+00	2.7E+00	1.6E+00	1.0E+00	7.3E-01	4.8E-01
	3.7E-01	4.1E-01	3.6E-01			
1530 5125	0.0E-01	1.2E-02	8.8E-03	3.6E-03	1.7E-03	1.6E-03
ASSP 4	1.2E+01	7.4E+01	9.1E+01	9.1E+01	8.9E+01	4.4E+01
	7.7E+00	3.4E+00	2.1E+00	9.9E-01	7.5E-01	6.1E-01
	4.9E-01	5.5E-01	3.6E-01			
1531 4815	1.8E-02	3.8E-02	7.7E-03	3.4E-03	1.4E-03	1.3E-03
ASSP 4	9.3E+00	6.7E+01	9.5E+01	1.0E+02	1.0E+02	5.1E+01
	7.4E+00	3.4E+00	2.1E+00	1.3E+00	8.3E-01	8.9E-01
	6.8E-01	4.7E-01	4.1E-01			
1532 4207	9.0E-02	2.2E-02	7.1E-03	3.4E-03	3.0E-03	1.5E-03
ASSP 4	5.5E+00	5.9E+01	9.3E+01	1.1E+02	1.2E+02	5.5E+01
	7.4E+00	3.7E+00	2.3E+00	1.3E+00	1.0E+00	9.0E-01
	6.9E-01	5.7E-01	4.2E-01			

1533 4101	3.7E-02	2.4E-02	9.9E-03	4.2E-03	2.1E-03	1.4E-03
ASSP 4	5.9E+00	5.1E+01	9.2E+01	1.1E+02	1.2E+02	6.5E+01
	8.2E+00	4.4E+00	2.6E+00	1.2E+00	1.1E+00	1.1E+00
	8.1E-01	6.9E-01	6.0E-01			
1534 3912	3.5E-02	3.3E-02	7.6E-03	4.0E-03	2.0E-03	3.3E-04
ASSP 4	5.9E+00	5.2E+01	9.0E+01	1.2E+02	1.2E+02	6.4E+01
	8.9E+00	4.1E+00	2.9E+00	1.6E+00	1.1E+00	8.1E-01
	8.0E-01	6.2E-01	5.0E-01			
1535 3761	9.3E-02	3.3E-02	8.6E-03	3.1E-03	1.6E-03	5.2E-04
ASSP 4	7.4E+00	5.8E+01	9.1E+01	1.1E+02	1.2E+02	5.9E+01
	8.3E+00	4.3E+00	2.4E+00	1.2E+00	1.0E+00	1.0E+00
	8.5E-01	6.5E-01	4.8E-01			
1536 4105	1.3E-01	3.0E-02	8.5E-03	2.4E-03	2.5E-03	8.5E-04
ASSP 4	6.9E+00	5.9E+01	9.3E+01	1.1E+02	1.2E+02	5.2E+01
	8.0E+00	3.6E+00	2.3E+00	1.3E+00	9.8E-01	8.2E-01
	8.6E-01	5.8E-01	4.5E-01			
1537 4442	5.6E-02	1.6E-02	2.0E-03	1.8E-03	9.5E-04	3.5E-04
ASSP 4	8.2E+00	6.1E+01	9.3E+01	1.1E+02	1.1E+02	4.8E+01
	7.7E+00	3.4E+00	2.1E+00	1.4E+00	1.1E+00	9.4E-01
	7.7E-01	4.5E-01	5.7E-01			
1538 4863	0.0E-01	4.0E-03	7.2E-03	1.7E-03	9.3E-04	5.1E-04
ASSP 4	1.1E+01	6.8E+01	9.2E+01	1.0E+02	9.7E+01	4.1E+01
	6.3E+00	3.3E+00	1.9E+00	1.1E+00	7.8E-01	8.3E-01
	6.8E-01	5.5E-01	3.7E-01			
1539 4899	0.0E-01	8.0E-03	1.3E-03	1.7E-03	4.7E-04	1.7E-04
ASSP 4	1.0E+01	6.8E+01	9.0E+01	9.3E+01	8.5E+01	3.2E+01
	5.4E+00	2.9E+00	1.8E+00	1.0E+00	8.9E-01	7.2E-01
	6.8E-01	4.3E-01	4.5E-01			
1540 5172	0.0E-01	1.2E-02	5.3E-03	1.4E-03	4.8E-04	7.0E-04
ASSP 4	1.3E+01	7.7E+01	8.9E+01	8.4E+01	7.4E+01	2.6E+01
	4.5E+00	3.0E+00	1.6E+00	8.6E-01	8.9E-01	6.1E-01
	6.0E-01	5.2E-01	3.1E-01			
1541 5321	1.8E-02	2.0E-03	2.0E-03	1.0E-03	1.6E-03	1.7E-04
ASSP 4	2.0E+01	8.7E+01	8.8E+01	8.2E+01	6.6E+01	2.5E+01
	4.5E+00	3.0E+00	1.5E+00	7.4E-01	7.6E-01	6.5E-01
	7.0E-01	4.4E-01	3.0E-01			
1542 5256	0.0E-01	6.3E-03	0.0E-01	1.1E-03	4.8E-04	1.8E-04
ASSP 4	1.8E+01	8.1E+01	9.0E+01	8.1E+01	6.8E+01	2.7E+01
	5.2E+00	2.8E+00	1.9E+00	1.0E+00	8.2E-01	7.4E-01
	6.8E-01	4.3E-01	3.8E-01			
1543 5365	0.0E-01	6.5E-03	3.5E-03	1.1E-03	1.0E-03	1.8E-04
ASSP 4	1.9E+01	8.2E+01	8.9E+01	8.1E+01	7.2E+01	2.7E+01
	5.7E+00	2.8E+00	1.9E+00	1.1E+00	8.1E-01	6.5E-01
	5.8E-01	4.9E-01	4.0E-01			
1544 5365	0.0E-01	8.3E-03	2.0E-03	7.1E-04	2.4E-04	8.9E-04
ASSP 4	2.0E+01	8.1E+01	9.1E+01	8.1E+01	7.1E+01	2.8E+01
	5.4E+00	3.2E+00	1.8E+00	9.8E-01	9.3E-01	6.1E-01
	5.6E-01	5.5E-01	4.1E-01			
1545 4899	0.0E-01	6.1E-03	4.0E-03	7.0E-04	1.2E-03	5.2E-04
ASSP 4	1.9E+01	7.9E+01	9.2E+01	9.1E+01	8.3E+01	3.4E+01
	6.0E+00	3.3E+00	2.1E+00	1.1E+00	1.0E+00	1.0E+00
	8.4E-01	5.7E-01	4.2E-01			
1546 4101	3.7E-02	1.4E-02	3.3E-03	2.1E-03	2.3E-03	6.9E-04
ASSP 4	1.4E+01	6.8E+01	9.8E+01	1.1E+02	1.1E+02	4.4E+01
	7.1E+00	3.9E+00	2.3E+00	1.2E+00	1.1E+00	8.9E-01
	8.1E-01	7.1E-01	4.2E-01			

1547 3299	9.4E-02	1.5E-02	6.1E-03	4.3E-03	4.3E-03	5.1E-03
ASSP 4	7.1E+00	5.4E+01	9.2E+01	1.2E+02	1.4E+02	6.2E+01
	1.1E+01	5.9E+00	3.6E+00	1.7E+00	1.3E+00	1.4E+00
	1.1E+00	9.3E-01	6.0E-01			
1548 3166	9.6E-02	5.9E-02	9.9E-03	7.6E-03	7.7E-03	7.2E-03
ASSP 4	5.5E+00	4.5E+01	8.6E+01	1.2E+02	6.5E+00	7.0E+01
	1.6E+01	8.8E+00	5.0E+00	2.4E+00	1.7E+00	1.6E+00
	1.4E+00	1.2E+00	9.0E-01			
1549 2737	9.2E-02	6.5E-02	2.0E-02	1.5E-02	1.2E-02	6.9E-03
ASSP 4	5.2E+00	4.4E+01	8.4E+01	1.2E+02	8.1E+00	7.3E+01
	1.8E+01	9.3E+00	5.8E+00	2.1E+00	1.8E+00	1.4E+00
	1.2E+00	1.1E+00	7.7E-01			
1550 2826	2.4E-01	4.7E-02	1.8E-02	1.5E-02	1.3E-02	4.5E-03
ASSP 4	4.6E+00	4.2E+01	8.3E+01	1.2E+02	6.8E+00	7.9E+01
	1.8E+01	1.1E+01	6.5E+00	2.6E+00	1.9E+00	2.0E+00
	1.6E+00	9.9E-01	8.1E-01			
1551 2804	2.3E-01	5.4E-02	3.1E-02	2.0E-02	1.0E-02	6.6E-03
ASSP 4	3.9E+00	4.2E+01	8.4E+01	1.2E+02	5.5E-01	7.9E+01
	1.8E+01	9.9E+00	5.8E+00	2.6E+00	1.8E+00	1.5E+00
	1.4E+00	1.2E+00	9.3E-01			
1552 2748	1.5E-01	6.2E-02	3.7E-02	1.8E-02	1.2E-02	2.9E-03
ASSP 4	4.6E+00	4.2E+01	8.0E+01	1.2E+02	1.4E+02	7.6E+01
	1.8E+01	9.4E+00	5.4E+00	2.7E+00	1.8E+00	1.6E+00
	1.6E+00	1.1E+00	7.9E-01			
1553 2754	2.4E-01	8.0E-02	4.2E-02	3.6E-02	1.3E-02	2.6E-03
ASSP 4	5.6E+00	4.9E+01	8.5E+01	1.3E+02	1.4E+02	6.4E+01
	1.7E+01	8.8E+00	4.8E+00	2.2E+00	1.7E+00	1.6E+00
	1.3E+00	1.2E+00	7.1E-01			
1554 2876	2.8E-01	1.4E-01	6.1E-02	1.8E-02	1.3E-02	2.3E-03
ASSP 4	5.2E+00	4.7E+01	8.7E+01	1.3E+02	1.4E+02	5.9E+01
	1.6E+01	8.4E+00	4.7E+00	2.1E+00	1.7E+00	1.5E+00
	1.2E+00	9.5E-01	7.0E-01			
1555 2812	0.0E-01	1.3E-01	4.5E-02	9.1E-03	3.0E-03	1.0E-03
ASSP 4	6.0E+00	5.1E+01	9.0E+01	1.3E+02	1.4E+02	5.0E+01
	1.5E+01	8.3E+00	4.4E+00	2.0E+00	1.7E+00	1.4E+00
	1.6E+00	9.0E-01	6.7E-01			
1556 3071	1.3E-01	8.7E-02	4.4E-02	1.1E-02	4.9E-03	1.5E-03
ASSP 4	6.7E+00	5.0E+01	8.8E+01	1.3E+02	1.3E+02	4.8E+01
	1.3E+01	7.3E+00	4.0E+00	1.9E+00	1.7E+00	1.2E+00
	1.1E+00	8.9E-01	8.6E-01			
1557 3545	9.2E-02	9.7E-02	3.8E-02	7.9E-03	3.3E-03	8.6E-04
ASSP 4	7.0E+00	5.5E+01	9.0E+01	1.2E+02	1.1E+02	3.8E+01
	1.0E+01	5.8E+00	3.0E+00	1.8E+00	1.6E+00	1.1E+00
	9.7E-01	6.7E-01	5.1E-01			
1558 3275	2.3E-01	1.4E-01	4.9E-02	9.5E-03	4.0E-03	1.5E-03
ASSP 4	6.3E+00	5.4E+01	9.0E+01	1.2E+02	1.1E+02	3.5E+01
	8.5E+00	4.8E+00	2.5E+00	1.6E+00	1.2E+00	1.1E+00
	8.7E-01	6.4E-01	3.6E-01			
1559 3353	2.6E-01	1.5E-01	4.9E-02	7.9E-03	6.9E-03	1.5E-03
ASSP 4	7.0E+00	5.1E+01	9.2E+01	1.2E+02	1.2E+02	3.6E+01
	1.0E+01	5.3E+00	2.9E+00	1.7E+00	1.6E+00	1.2E+00
	9.3E-01	5.5E-01	5.4E-01			
1600 3365	3.2E-01	1.5E-01	4.0E-02	1.5E-02	6.4E-03	9.4E-04
ASSP 4	6.0E+00	4.9E+01	8.7E+01	1.2E+02	1.2E+02	3.9E+01
	1.2E+01	5.8E+00	2.9E+00	1.5E+00	1.2E+00	1.2E+00
	8.3E-01	5.4E-01	4.1E-01			

1614 3049	1.0E-01	1.2E-01	3.4E-02	4.0E-03	8.9E-04	0.0E-01
ASSP 4	5.3E+00	4.5E+01	7.8E+01	1.1E+02	1.1E+02	4.7E+01
	1.3E+01	8.0E+00	4.2E+00	1.8E+00	1.5E+00	1.3E+00
	1.1E+00	8.8E-01	5.6E-01			
1615 3197	1.7E-01	1.2E-01	3.1E-02	4.8E-03	6.5E-04	0.0E-01
ASSP 4	5.2E+00	4.4E+01	8.1E+01	1.1E+02	1.2E+02	4.7E+01
	1.5E+01	8.8E+00	4.6E+00	2.2E+00	2.1E+00	1.6E+00
	1.5E+00	1.0E+00	7.5E-01			
1616 2891	1.6E-01	1.4E-01	3.2E-02	2.7E-03	6.8E-04	0.0E-01
ASSP 4	5.4E+00	4.3E+01	7.8E+01	1.1E+02	1.2E+02	4.6E+01
	1.6E+01	9.4E+00	5.2E+00	2.2E+00	1.8E+00	1.5E+00
	1.2E+00	9.4E-01	4.9E-01			
1629 2957	4.4E-01	9.7E-02	8.5E-03	9.5E-04	0.0E-01	0.0E-01
ASSP 4	2.9E+00	3.2E+01	6.5E+01	1.1E+02	1.2E+02	4.8E+01
	2.8E+01	1.5E+01	6.4E+00	2.9E+00	2.7E+00	1.8E+00
	1.7E+00	1.3E+00	8.2E-01			
1630 2816	2.9E-01	9.8E-02	7.5E-03	6.1E-04	0.0E-01	0.0E-01
ASSP 4	4.9E+00	3.4E+01	6.6E+01	1.0E+02	1.2E+02	4.9E+01
	2.6E+01	1.5E+01	6.2E+00	2.5E+00	2.5E+00	2.0E+00
	1.5E+00	1.1E+00	5.4E-01			
1631 2812	3.6E-01	7.8E-02	9.3E-03	3.0E-04	0.0E-01	0.0E-01
ASSP 4	5.4E+00	3.5E+01	6.7E+01	1.0E+02	1.2E+02	4.9E+01
	2.8E+01	1.6E+01	6.6E+00	2.7E+00	2.5E+00	1.8E+00
	1.5E+00	1.3E+00	7.3E-01			
1644 2542	4.5E-01	8.3E-02	4.8E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.3E+01	6.5E+01	8.8E+01	1.2E+02	1.1E+02	4.7E+01
	2.6E+01	1.3E+01	6.3E+00	2.7E+00	2.6E+00	1.8E+00
	1.9E+00	1.1E+00	5.5E-01			
1645 2677	3.2E-01	7.9E-02	7.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.3E+01	4.6E+01	6.8E+01	9.8E+01	1.1E+02	5.2E+01
	3.2E+01	1.8E+01	7.6E+00	3.1E+00	2.4E+00	2.2E+00
	1.7E+00	1.3E+00	6.5E-01			
1646 2387	6.9E-01	1.1E-01	3.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.9E+00	2.6E+01	5.3E+01	8.8E+01	1.1E+02	5.1E+01
	3.5E+01	1.9E+01	8.4E+00	3.7E+00	3.2E+00	2.6E+00
	2.0E+00	1.5E+00	9.5E-01			
1659 2671	8.8E-01	2.5E-01	1.5E-02	3.0E-04	2.0E-04	0.0E-01
ASSP 4	9.2E+00	2.7E+01	5.4E+01	1.0E+02	1.2E+02	5.3E+01
	3.3E+01	1.7E+01	6.6E+00	3.1E+00	2.6E+00	2.0E+00
	1.4E+00	9.8E-01	5.2E-01			
1700 2304	1.2E+00	2.8E-01	8.0E-03	6.0E-04	0.0E-01	0.0E-01
ASSP 4	8.5E+00	2.7E+01	5.3E+01	1.0E+02	1.3E+02	5.6E+01
	3.2E+01	1.7E+01	7.6E+00	3.3E+00	2.7E+00	2.4E+00
	1.8E+00	1.3E+00	6.8E-01			
1701 2240	1.1E+00	2.7E-01	1.2E-02	6.3E-04	0.0E-01	0.0E-01
ASSP 4	1.5E+01	2.9E+01	5.4E+01	9.5E+01	1.3E+02	6.2E+01
	3.7E+01	1.9E+01	8.9E+00	3.7E+00	3.1E+00	2.5E+00
	2.0E+00	1.5E+00	9.4E-01			

1714 2579	6.1E-01	3.3E-02	1.1E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	3.8E+01	6.3E+01	1.1E+02	1.0E+02	4.8E+01
	3.7E+01	1.5E+01	5.4E+00	3.9E+00	3.2E+00	2.0E+00
	1.4E+00	5.4E-01	4.1E-01			
1715 2269	3.8E-01	1.1E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.3E+00	3.2E+01	7.0E+01	1.2E+02	8.6E+01	4.8E+01
	3.2E+01	9.8E+00	4.1E+00	3.5E+00	2.3E+00	1.5E+00
	8.6E-01	3.0E-01	1.1E-01			
1716 1987	7.8E-01	4.7E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.5E+00	3.3E+01	8.3E+01	1.3E+02	7.5E+01	3.8E+01
	2.6E+01	7.4E+00	4.5E+00	3.0E+00	2.5E+00	1.2E+00
	7.7E-01	3.1E-01	4.6E-02			
1729 2478	1.0E+00	1.3E-01	7.9E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+00	2.8E+01	7.1E+01	1.2E+02	9.1E+01	3.5E+01
	2.6E+01	9.7E+00	4.2E+00	3.3E+00	2.9E+00	1.8E+00
	1.2E+00	7.2E-01	3.1E-01			
1730 2321	9.8E-01	9.9E-02	6.1E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.2E+00	3.2E+01	6.4E+01	1.0E+02	9.2E+01	4.8E+01
	3.7E+01	1.4E+01	5.1E+00	3.9E+00	3.4E+00	2.3E+00
	1.2E+00	7.4E-01	2.7E-01			
1731 2241	1.2E+00	1.3E-01	6.6E-03	2.9E-04	0.0E-01	0.0E-01
ASSP 4	2.3E+00	2.4E+01	5.9E+01	1.0E+02	9.9E+01	4.6E+01
	3.5E+01	1.5E+01	5.5E+00	4.0E+00	3.2E+00	2.2E+00
	1.8E+00	9.6E-01	5.2E-01			
1744 2573	4.0E-01	6.0E-02	6.9E-03	8.3E-04	1.1E-03	1.4E-04
ASSP 4	6.7E+00	3.7E+01	7.5E+01	1.2E+02	9.1E+01	3.2E+01
	2.4E+01	9.0E+00	4.5E+00	3.4E+00	2.8E+00	2.1E+00
	1.3E+00	6.8E-01	3.0E-01			
1745 2561	2.2E-01	3.2E-02	1.5E-03	2.7E-04	0.0E-01	0.0E-01
ASSP 4	3.4E+00	3.4E+01	8.7E+01	1.4E+02	7.4E+01	2.7E+01
	1.8E+01	6.3E+00	3.5E+00	3.0E+00	2.5E+00	1.6E+00
	9.1E-01	4.9E-01	2.2E-01			
1746 2932	1.8E-01	2.1E-02	1.6E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.6E+01	5.9E+01	1.1E+02	2.0E+00	5.1E+01	2.4E+01
	1.6E+01	5.0E+00	4.1E+00	2.9E+00	2.2E+00	1.3E+00
	6.3E-01	2.4E-01	1.4E-01			
1759 2534	7.2E-01	1.0E-01	2.1E-02	5.2E-03	1.6E-03	2.9E-04
ASSP 4	7.7E+00	5.3E+01	1.0E+02	1.3E+02	5.7E+01	2.5E+01
	1.7E+01	5.7E+00	3.6E+00	3.1E+00	2.7E+00	1.3E+00
	7.1E-01	3.5E-01	1.3E-01			
1800 2495	5.7E-01	8.3E-02	2.2E-02	6.4E-03	1.6E-03	4.3E-04
ASSP 4	5.6E+00	5.2E+01	1.0E+02	1.2E+02	5.4E+01	2.4E+01
	1.6E+01	5.4E+00	4.0E+00	3.2E+00	2.6E+00	1.6E+00
	9.7E-01	3.6E-01	2.3E-01			
1801 2390	7.9E-01	1.4E-01	3.8E-02	6.1E-03	3.6E-03	7.3E-04
ASSP 4	7.3E+00	5.0E+01	1.0E+02	1.3E+02	6.1E+01	2.5E+01
	1.7E+01	5.6E+00	4.0E+00	3.0E+00	2.4E+00	1.7E+00
	1.2E+00	3.1E-01	2.5E-01			

1814 2210	1.6E-01	4.8E-02	2.6E-03	2.7E-04	0.0E-01	0.0E-01
ASSP 4	4.1E+01	8.4E+01	1.3E+02	1.1E+01	5.2E+01	3.0E+01
	1.7E+01	5.4E+00	4.4E+00	3.5E+00	2.2E+00	1.1E+00
	7.8E-01	1.9E-01	2.0E-01			
1815 2051	8.3E-01	1.1E-01	7.8E-03	2.9E-04	0.0E-01	0.0E-01
ASSP 4	4.8E+01	8.7E+01	1.3E+02	8.6E+00	5.7E+01	3.2E+01
	1.9E+01	6.2E+00	4.9E+00	4.0E+00	2.9E+00	1.8E+00
	1.1E+00	4.0E-01	3.7E-01			
1816 2098	9.8E-01	1.2E-01	9.1E-03	0.0E-01	0.0E-01	1.6E-04
ASSP 4	5.1E+01	8.4E+01	1.3E+02	9.2E+00	6.5E+01	3.0E+01
	1.9E+01	6.0E+00	4.7E+00	3.5E+00	2.8E+00	1.7E+00
	9.3E-01	3.4E-01	2.4E-01			
1829 3005	3.9E-01	7.0E-02	8.9E-03	1.2E-03	0.0E-01	0.0E-01
ASSP 4	1.8E+01	7.9E+01	1.2E+02	1.1E+02	4.0E+01	1.4E+01
	9.6E+00	3.9E+00	3.4E+00	2.3E+00	1.8E+00	1.1E+00
	6.5E-01	3.4E-01	1.5E-01			
1830 2950	2.6E-01	4.3E-02	6.1E-03	2.9E-04	4.0E-04	0.0E-01
ASSP 4	1.6E+01	7.9E+01	1.2E+02	1.0E+02	3.9E+01	1.4E+01
	9.7E+00	3.9E+00	2.9E+00	2.4E+00	1.7E+00	1.0E+00
	6.8E-01	3.1E-01	6.5E-02			
1831 2708	3.1E-01	5.7E-02	7.3E-03	5.9E-04	4.0E-04	0.0E-01
ASSP 4	1.8E+01	8.0E+01	1.3E+02	1.1E+02	4.2E+01	1.5E+01
	9.6E+00	4.2E+00	3.8E+00	2.5E+00	1.8E+00	1.2E+00
	7.2E-01	3.1E-01	1.5E-01			
1844 2986	1.0E+00	1.1E-01	2.4E-02	1.3E-03	7.3E-04	1.1E-03
ASSP 4	3.6E+01	1.1E+02	1.3E+02	9.4E+01	2.8E+01	1.3E+01
	8.4E+00	3.8E+00	3.4E+00	2.4E+00	1.8E+00	9.6E-01
	5.4E-01	2.2E-01	1.1E-01			
1845 2943	8.7E-01	3.8E-02	6.4E-03	0.0E-01	6.3E-04	1.5E-04
ASSP 4	2.0E+01	9.2E+01	1.3E+02	9.8E+01	2.8E+01	1.3E+01
	7.6E+00	4.0E+00	2.7E+00	2.2E+00	1.4E+00	6.6E-01
	3.8E-01	1.8E-01	1.1E-01			
1846 3113	1.1E-01	1.8E-02	5.4E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.5E+01	9.9E+01	1.3E+02	9.4E+01	2.8E+01	1.3E+01
	8.2E+00	4.1E+00	3.3E+00	2.1E+00	1.6E+00	9.5E-01
	2.9E-01	2.1E-01	1.6E-01			
1859 3935	3.2E-02	3.5E-03	5.7E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	9.1E+01	8.0E+01	5.8E+01	1.8E+01	1.1E+01
	7.1E+00	2.3E+00	2.0E+00	1.3E+00	1.1E+00	4.8E-01
	3.0E-01	7.4E-02	9.3E-02			
1900 3943	3.4E-02	1.9E-02	6.1E-04	.0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+01	8.7E+01	7.5E+01	5.6E+01	1.8E+01	1.1E+01
	6.8E+00	1.9E+00	1.9E+00	1.3E+00	8.6E-01	3.6E-01
	2.4E-01	8.3E-02	3.7E-02			
1901 3943	1.0E-01	1.9E-02	5.0E-03	3.3E-04	0.0E-01	0.0E-01
ASSP 4	3.2E+01	8.2E+01	7.5E+01	5.8E+01	1.8E+01	1.1E+01
	6.9E+00	2.2E+00	1.8E+00	1.3E+00	8.2E-01	4.8E-01
	4.3E-01	1.0E-01	1.1E-01			

1914 3228	6.3E-02	1.0E-02	4.0E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.9E+01	1.4E+02	1.2E+02	9.2E+01	2.4E+01	1.2E+01
	7.0E+00	2.9E+00	2.7E+00	1.8E+00	1.4E+00	7.9E-01
	5.4E-01	1.9E-01	1.3E-01			
1915 3133	3.3E-02	1.3E-02	2.9E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.4E+01	1.4E+02	1.3E+02	9.8E+01	2.5E+01	1.2E+01
	7.3E+00	3.3E+00	2.5E+00	1.9E+00	1.4E+00	6.6E-01
	4.4E-01	1.3E-01	1.1E-01			
1916 3205	3.4E-02	5.6E-03	1.8E-03	3.2E-04	0.0E-01	0.0E-01
ASSP 4	6.6E+01	1.3E+02	1.3E+02	1.0E+02	2.8E+01	1.2E+01
	8.0E+00	3.4E+00	2.7E+00	2.0E+00	1.5E+00	7.6E-01
	4.5E-01	1.9E-01	1.3E-01			
1929 2333	5.2E-02	1.7E-02	1.9E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.9E+01	1.1E+02	1.3E+02	1.2E+02	3.9E+01	2.1E+01
	1.2E+01	4.2E+00	3.8E+00	2.6E+00	2.1E+00	1.0E+00
	6.3E-01	3.6E-01	1.9E-01			
1930 2167	3.6E-02	2.4E-02	3.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E+01	1.1E+02	1.3E+02	1.3E+02	4.4E+01	2.3E+01
	1.4E+01	4.7E+00	3.6E+00	2.5E+00	1.8E+00	1.1E+00
	6.8E-01	3.0E-01	3.1E-01			
1931 2161	8.8E-02	3.1E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+02	1.7E+02	1.5E+01	1.2E+02	4.4E+01	2.3E+01
	1.3E+01	5.2E+00	3.6E+00	2.4E+00	2.1E+00	1.4E+00
	6.7E-01	3.4E-01	2.9E-01			
1944 1949	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+01	7.7E+01	1.3E+02	1.4E+02	4.4E+01	2.9E+01
	1.4E+01	5.3E+00	4.2E+00	3.2E+00	2.5E+00	1.6E+00
	7.3E-01	3.9E-01	3.3E-01			
1945 1890	0.0E-01	1.9E-03	6.1E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	7.8E+01	1.4E+02	1.4E+02	3.9E+01	2.6E+01
	1.2E+01	4.7E+00	4.4E+00	2.9E+00	2.1E+00	1.1E+00
	4.2E-01	1.9E-01	2.0E-01			
1946 1975	0.0E-01	1.9E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	8.2E+01	6.3E+00	1.4E+02	3.4E+01	2.3E+01
	1.1E+01	5.1E+00	3.7E+00	2.8E+00	1.9E+00	1.0E+00
	5.5E-01	2.4E-01	3.2E-01			
1959 2026	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	9.6E+01	3.6E+01	1.1E+02	2.3E+01	1.5E+01
	5.6E+00	4.0E+00	2.6E+00	1.5E+00	8.1E-01	3.8E-01
	2.1E-01	1.9E-01	4.6E-02			
2000 2141	1.7E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.2E+01	1.1E+02	4.2E+01	1.0E+02	2.0E+01	1.3E+01
	4.8E+00	3.9E+00	2.2E+00	1.2E+00	6.8E-01	2.4E-01
	1.2E-01	4.6E-02	2.8E-02			
2001 2270	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.6E+01	1.3E+02	4.6E+01	9.6E+01	2.0E+01	1.1E+01
	4.7E+00	3.3E+00	2.1E+00	1.0E+00	5.7E-01	1.4E-01
	1.0E-01	3.7E-02	0.0E-01			

2015 2946	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.3E+01	1.4E+02	1.6E+01	5.4E+01	1.4E+01	6.7E+00
	3.4E+00	2.3E+00	1.4E+00	6.6E-01	3.6E-01	5.6E-02
	3.7E-02	0.0E-01	0.0E-01			
2016 3078	1.5E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.4E+01	1.5E+02	1.1E+01	4.8E+01	1.3E+01	6.6E+00
	3.0E+00	2.1E+00	1.1E+00	6.2E-01	2.1E-01	8.3E-02
	6.5E-02	1.9E-02	0.0E-01			
2017 3081	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+01	1.4E+02	6.3E+00	4.5E+01	1.3E+01	6.3E+00
	2.8E+00	2.1E+00	1.1E+00	5.8E-01	3.6E-01	8.3E-02
	8.3E-02	0.0E-01	3.7E-02			
2018 3066	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.5E+01	1.5E+02	7.2E+00	4.3E+01	1.2E+01	5.8E+00
	2.9E+00	1.9E+00	9.9E-01	4.3E-01	1.5E-01	4.6E-02
	0.0E-01	1.9E-02	0.0E-01			
2019 3125	3.0E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.1E+01	1.6E+02	1.4E+00	3.4E+01	1.1E+01	4.5E+00
	2.2E+00	1.3E+00	6.2E-01	1.2E-01	8.3E-02	1.9E-02
	0.0E-01	0.0E-01	0.0E-01			
2020 3283	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.5E+01	1.7E+02	3.9E+00	4.4E+01	1.2E+01	5.3E+00
	1.8E+00	1.2E+00	8.3E-01	2.8E-01	1.0E-01	1.9E-02
	2.8E-02	9.3E-03	1.9E-02			
2021 3247	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.5E+01	1.6E+02	1.4E+01	4.3E+01	1.0E+01	4.9E+00
	1.9E+00	1.1E+00	8.3E-01	2.2E-01	1.0E-01	0.0E-01
	9.3E-03	0.0E-01	0.0E-01			
2022 3083	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+01	1.7E+02	3.2E+01	5.2E+01	1.1E+01	5.4E+00
	1.9E+00	1.3E+00	6.6E-01	3.1E-01	1.9E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2023 3076	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.2E+01	1.7E+02	2.1E+01	5.4E+01	1.1E+01	5.2E+00
	1.8E+00	1.2E+00	5.7E-01	2.9E-01	7.4E-02	5.6E-02
	1.9E-02	0.0E-01	0.0E-01			
2024 2913	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+02	2.1E+02	3.5E+01	6.0E+01	1.2E+01	5.3E+00
	2.1E+00	1.2E+00	6.7E-01	2.2E-01	1.0E-01	9.3E-03
	9.3E-03	0.0E-01	0.0E-01			
2025 3056	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.1E+02	6.3E-01	3.2E+01	5.5E+01	1.0E+01	5.1E+00
	1.9E+00	9.8E-01	6.2E-01	2.5E-01	6.5E-02	2.8E-02
	1.9E-02	0.0E-01	0.0E-01			
2026 2743	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.2E+01	1.6E+02	1.8E+01	4.9E+01	1.0E+01	4.5E+00
	1.9E+00	1.0E+00	5.3E-01	2.7E-01	9.3E-02	9.3E-03
	9.3E-03	0.0E-01	0.0E-01			
2027 3019	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.9E+01	1.5E+02	2.8E+01	4.8E+01	1.1E+01	4.8E+00
	1.9E+00	1.1E+00	6.0E-01	2.0E-01	1.1E-01	3.7E-02
	0.0E-01	9.3E-03	0.0E-01			
2028 3085	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+01	1.4E+02	1.6E+01	4.7E+01	1.1E+01	4.9E+00
	1.8E+00	1.0E+00	5.4E-01	2.3E-01	6.5E-02	0.0E-01
	1.9E-02	0.0E-01	0.0E-01			

2029 3176	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	1.3E+02	1.2E+01	4.1E+01	1.1E+01	4.7E+00
	2.0E+00	1.1E+00	6.6E-01	2.5E-01	1.2E-01	2.8E-02
	2.8E-02	9.3E-03	0.0E-01			
2030 2756	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+01	1.3E+02	1.6E+01	4.1E+01	9.7E+00	4.4E+00
	2.0E+00	1.1E+00	5.9E-01	2.1E-01	1.0E-01	3.7E-02
	9.3E-03	9.3E-03	0.0E-01			
2031 3353	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	1.3E+02	1.4E+02	3.3E+01	9.3E+00	4.1E+00
	1.4E+00	1.0E+00	6.0E-01	1.9E-01	4.6E-02	5.6E-02
	0.0E-01	9.3E-03	0.0E-01			
2032 3588	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.2E+01	1.2E+02	1.1E+02	2.5E+01	8.4E+00	3.4E+00
	1.4E+00	7.9E-01	4.2E-01	1.5E-01	5.6E-02	9.3E-03
	0.0E-01	0.0E-01	0.0E-01			
2033 3659	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	1.1E+02	1.1E+02	2.2E+01	8.7E+00	2.9E+00
	1.2E+00	9.4E-01	3.9E-01	1.3E-01	5.6E-02	0.0E-01
	9.3E-03	0.0E-01	0.0E-01			
2034 4021	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.2E+01	1.3E+02	9.3E+01	1.7E+01	7.7E+00	2.6E+00
	1.5E+00	7.1E-01	2.8E-01	9.3E-02	1.9E-02	0.0E-01
	0.0E-01	1.9E-02	9.3E-03			
2035 3996	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.0E+01	1.1E+02	9.0E+01	1.5E+01	8.0E+00	2.5E+00
	1.3E+00	7.5E-01	4.1E-01	3.7E-02	4.6E-02	2.8E-02
	9.3E-03	0.0E-01	0.0E-01			
2036 4057	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+01	1.1E+02	7.8E+01	1.5E+01	8.4E+00	2.3E+00
	1.0E+00	8.7E-01	5.2E-01	1.1E-01	4.6E-02	0.0E-01
	9.3E-03	0.0E-01	0.0E-01			
2037 4309	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.5E+01	1.1E+02	7.7E+01	1.8E+01	7.8E+00	2.9E+00
	1.4E+00	8.6E-01	3.5E-01	1.2E-01	5.6E-02	0.0E-01
	1.9E-02	1.9E-02	0.0E-01			
2038 4131	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.2E+02	7.3E+01	1.7E+01	7.7E+00	3.0E+00
	1.4E+00	6.2E-01	3.6E-01	1.2E-01	0.0E-01	0.0E-01
	0.0E-01	9.3E-03	0.0E-01			
2039 4058	0.0E-01	1.9E-03	6.2E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+02	1.5E+02	7.3E+01	1.9E+01	8.3E+00	3.3E+00
	1.2E+00	6.4E-01	3.4E-01	1.0E-01	3.7E-02	1.9E-02
	0.0E-01	0.0E-01	0.0E-01			
2040 4276	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.2E+02	1.3E+02	6.8E+01	1.9E+01	8.0E+00	3.2E+00
	1.3E+00	7.9E-01	5.1E-01	8.3E-02	1.0E-01	1.9E-02
	0.0E-01	9.3E-03	0.0E-01			
2041 4422	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.4E+01	9.3E+01	6.1E+01	1.8E+01	7.5E+00	3.4E+00
	1.2E+00	7.6E-01	3.5E-01	1.2E-01	4.6E-02	0.0E-01
	9.3E-03	0.0E-01	0.0E-01			
2042 4514	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.2E+01	8.2E+01	6.0E+01	1.7E+01	8.0E+00	3.1E+00
	1.2E+00	8.4E-01	3.2E-01	9.3E-02	7.4E-02	1.9E-02
	0.0E-01	0.0E-01	0.0E-01			

2043 4503	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.7E+01	8.0E+01	5.6E+01	1.5E+01	8.1E+00	3.3E+00
	9.1E-01	8.1E-01	3.2E-01	1.2E-01	4.6E-02	9.3E-03
	0.0E-01	0.0E-01	0.0E-01			
2044 4472	1.5E-02	1.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.8E+01	7.8E+01	5.6E+01	1.5E+01	7.4E+00	3.2E+00
	1.2E+00	8.7E-01	3.4E-01	8.3E-02	2.8E-02	9.3E-03
	9.3E-03	0.0E-01	9.3E-03			
2045 4665	0.0E-01	0.0E-01	5.6E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	8.1E+01	5.8E+01	1.6E+01	7.3E+00	3.0E+00
	1.2E+00	6.4E-01	2.9E-01	1.2E-01	2.8E-02	9.3E-03
	0.0E-01	0.0E-01	0.0E-01			
2046 4158	0.0E-01	1.7E-03	5.6E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+01	8.9E+01	7.1E+01	2.2E+01	8.1E+00	3.7E+00
	1.4E+00	8.9E-01	4.3E-01	1.7E-01	5.6E-02	1.9E-02
	0.0E-01	0.0E-01	0.0E-01			
2047 4207	0.0E-01	1.8E-03	2.3E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.7E+01	8.9E+01	7.1E+01	2.4E+01	7.9E+00	3.6E+00
	1.5E+00	7.6E-01	4.4E-01	8.3E-02	7.4E-02	9.3E-03
	9.3E-03	0.0E-01	0.0E-01			
2048 4397	1.5E-02	3.4E-03	2.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.2E+01	8.8E+01	6.9E+01	2.4E+01	9.0E+00	4.4E+00
	1.4E+00	7.8E-01	4.5E-01	1.7E-01	1.1E-01	1.9E-02
	0.0E-01	0.0E-01	1.9E-02			
2049 4432	0.0E-01	1.7E-03	1.1E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.3E+01	7.4E+01	6.2E+01	2.0E+01	8.7E+00	4.0E+00
	1.6E+00	7.7E-01	4.8E-01	1.6E-01	4.6E-02	1.9E-02
	0.0E-01	0.0E-01	0.0E-01			
2050 4524	0.0E-01	0.0E-01	1.1E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.2E+01	7.3E+01	5.9E+01	2.1E+01	9.1E+00	4.0E+00
	1.1E+00	7.7E-01	3.5E-01	1.3E-01	5.6E-02	0.0E-01
	9.3E-03	0.0E-01	0.0E-01			

Fog $4C_1$. August 4 (Day 216) 1975

DAY 216 NUMBER DENSITY (NO./CC/MICRON)
HOUR VSBY 1ST LINE = OAP LINES 2,3&4 = ASSP

0640 4545	0.0E-01	6.4E-03	5.2E-03	5.5E-04	3.7E-04	0.0E-01
ASSP 4	1.4E+01	6.3E+01	5.1E+01	5.0E+01	4.2E+01	2.3E+01
	6.9E+00	4.4E+00	2.7E+00	1.3E+00	8.4E-01	4.8E-01
	6.1E-01	4.5E-01	3.4E-01			
0641 4367	9.2E-02	1.0E-02	2.2E-03	5.6E-04	0.0E-01	0.0E-01
ASSP 4	1.4E+01	6.1E+01	5.4E+01	5.3E+01	4.3E+01	2.5E+01
	7.1E+00	4.3E+00	2.4E+00	1.4E+00	7.1E-01	4.3E-01
	6.1E-01	4.2E-01	2.9E-01			
0642 4918	0.0E-01	9.3E-03	0.0E-01	0.0E-01	3.6E-04	0.0E-01
ASSP 4	2.2E+01	6.5E+01	5.5E+01	4.8E+01	4.2E+01	2.5E+01
	8.0E+00	4.6E+00	3.1E+00	1.4E+00	8.1E-01	7.0E-01
	6.4E-01	4.8E-01	5.0E-01			
0643 4203	0.0E-01	7.0E-03	3.4E-03	0.0E-01	4.0E-04	3.0E-04
ASSP 4	1.9E+01	5.8E+01	5.0E+01	4.6E+01	3.8E+01	2.5E+01
	8.6E+00	4.9E+00	3.0E+00	1.6E+00	8.7E-01	6.2E-01
	5.4E-01	4.3E-01	3.7E-01			
0644 3575	2.9E-02	6.4E-03	0.0E-01	5.4E-04	1.5E-03	2.7E-04
ASSP 4	1.0E+01	5.3E+01	5.6E+01	6.3E+01	5.9E+01	3.4E+01
	1.1E+01	5.9E+00	4.0E+00	1.8E+00	1.2E+00	9.0E-01
	7.1E-01	5.1E-01	8.1E-01			
0645 3012	5.2E-02	1.4E-02	2.8E-03	9.8E-04	3.3E-04	9.8E-04
ASSP 4	7.2E+00	4.0E+01	5.8E+01	7.8E+01	8.6E+01	5.6E+01
	1.6E+01	8.3E+00	5.7E+00	3.0E+00	1.4E+00	1.3E+00
	1.3E+00	1.2E+00	8.4E-01			
0646 1818	0.0E-01	6.8E-03	6.6E-03	3.5E-03	1.2E-03	0.0E-01
ASSP 4	1.6E+00	2.3E+01	5.8E+01	7.5E+01	9.8E+01	8.7E+01
	3.5E+01	2.2E+01	1.5E+01	7.7E+00	3.1E+00	2.3E+00
	2.2E+00	2.2E+00	1.7E+00			
0647 1057	2.6E-02	2.8E-02	6.5E-03	4.9E-04	3.3E-04	2.4E-04
ASSP 4	1.3E+00	1.1E+01	3.6E+01	4.8E+01	6.7E+01	7.5E+01
	6.7E+01	5.1E+01	3.4E+01	2.0E+01	9.0E+00	6.8E+00
	6.4E+00	5.4E+00	4.7E+00			
0648 792	1.6E-01	4.2E-02	1.5E-02	2.0E-03	6.9E-04	2.0E-03
ASSP 4	6.5E-01	9.5E+00	3.0E+01	4.2E+01	6.2E+01	6.8E+01
	6.7E+01	5.0E+01	3.4E+01	2.0E+01	9.3E+00	7.3E+00
	7.1E+00	6.1E+00	6.0E+00			
0649 703	1.7E-01	7.2E-02	1.2E-02	2.7E-03	9.2E-04	2.3E-04
ASSP 4	8.7E-01	9.8E+00	3.0E+01	3.9E+01	5.8E+01	6.9E+01
	6.1E+01	4.4E+01	3.0E+01	1.9E+01	8.7E+00	7.1E+00
	7.1E+00	6.6E+00	5.8E+00			
0650 513	3.6E-01	9.0E-02	5.5E-03	1.9E-03	2.9E-03	4.8E-04
ASSP 4	1.3E+00	9.7E+00	2.8E+01	3.8E+01	6.2E+01	6.3E+01
	5.7E+01	4.1E+01	3.0E+01	1.7E+01	8.9E+00	7.2E+00
	6.9E+00	7.0E+00	6.1E+00			
0651 495	4.0E-01	7.5E-02	1.3E-02	6.2E-03	3.5E-03	1.4E-03
ASSP 4	1.2E+00	9.1E+00	2.7E+01	3.9E+01	5.8E+01	6.2E+01
	5.2E+01	3.7E+01	2.8E+01	1.5E+01	7.5E+00	7.0E+00
	6.7E+00	6.3E+00	6.3E+00			
0652 500	5.3E-01	9.6E-02	1.3E-02	6.0E-03	2.4E-03	1.5E-03
ASSP 4	6.5E-01	8.9E+00	2.6E+01	3.7E+01	5.8E+01	6.5E+01
	5.3E+01	4.1E+01	2.7E+01	1.6E+01	7.8E+00	7.0E+00
	6.6E+00	6.2E+00	6.2E+00			

AD-A039 776 OFFICE OF NAVAL RESEARCH ARLINGTON VA F/G 4/2
MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)
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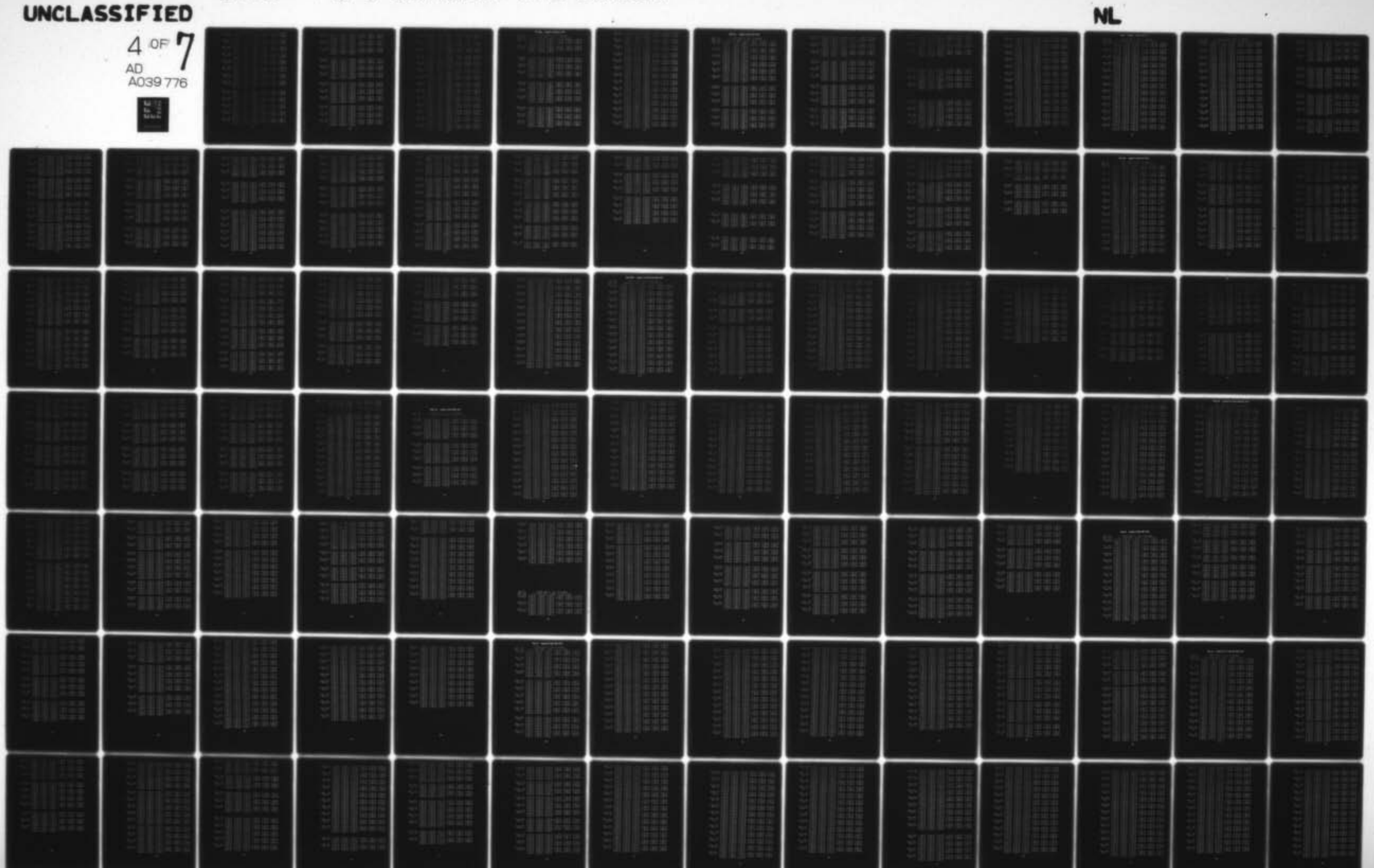

0653 442	3.1E-01	9.6E-02	2.1E-02	4.5E-03	1.8E-03	1.8E-03
ASSP 4	1.2E+00	1.1E+01	2.8E+01	3.6E+01	5.7E+01	6.2E+01
	5.3E+01	3.9E+01	2.4E+01	1.5E+01	7.9E+00	6.5E+00
	5.7E+00	6.2E+00	5.6E+00			
0654 420	5.5E-01	9.8E-02	1.5E-02	3.7E-03	9.5E-04	7.0E-04
ASSP 4	2.1E+00	1.3E+01	2.8E+01	3.9E+01	5.7E+01	6.1E+01
	5.0E+01	3.5E+01	2.3E+01	1.3E+01	8.1E+00	6.9E+00
	7.0E+00	6.6E+00	6.4E+00			
0655 406	5.6E-01	1.5E-01	1.8E-02	4.8E-03	2.2E-03	1.4E-03
ASSP 4	1.7E+00	1.2E+01	3.1E+01	4.2E+01	6.5E+01	6.4E+01
	4.9E+01	3.6E+01	2.2E+01	1.3E+01	7.3E+00	6.9E+00
	6.9E+00	6.9E+00	7.2E+00			
0656 422	6.0E-01	1.7E-01	3.3E-02	5.4E-03	3.4E-03	1.3E-03
ASSP 4	1.4E+00	1.0E+01	2.9E+01	4.3E+01	6.5E+01	6.2E+01
	4.8E+01	3.3E+01	2.4E+01	1.4E+01	8.2E+00	7.3E+00
	7.6E+00	7.5E+00	6.9E+00			
0657 424	5.9E-01	1.7E-01	3.0E-02	8.9E-03	4.0E-03	1.5E-03
ASSP 4	1.4E+00	9.7E+00	3.1E+01	4.7E+01	6.6E+01	6.4E+01
	4.2E+01	3.0E+01	2.0E+01	1.3E+01	7.5E+00	5.9E+00
	7.1E+00	5.9E+00	6.6E+00			
0658 504	3.7E-01	1.9E-01	2.9E-02	6.3E-03	3.9E-03	2.6E-03
ASSP 4	2.0E+00	1.4E+01	3.0E+01	4.6E+01	6.7E+01	6.0E+01
	3.8E+01	2.6E+01	1.8E+01	1.1E+01	7.1E+00	6.4E+00
	6.1E+00	5.9E+00	5.4E+00			
0659 382	3.4E-01	1.7E-01	3.1E-02	7.8E-03	4.0E-03	1.8E-03
ASSP 4	1.4E+00	8.8E+00	3.1E+01	4.6E+01	6.9E+01	7.3E+01
	4.4E+01	3.0E+01	2.1E+01	1.4E+01	8.4E+00	7.6E+00
	7.7E+00	6.7E+00	6.9E+00			
0700 389	5.4E-01	2.2E-01	3.9E-02	8.5E-03	7.7E-03	2.3E-03
ASSP 4	1.4E+00	9.1E+00	3.1E+01	4.7E+01	7.0E+01	6.9E+01
	4.4E+01	3.2E+01	2.1E+01	1.3E+01	7.0E+00	6.8E+00
	6.6E+00	6.0E+00	6.0E+00			
0713 400	1.6E+00	3.3E-01	6.4E-02	1.5E-02	4.2E-03	9.5E-04
ASSP 4	5.9E+00	4.8E+01	9.0E+01	1.3E+02	1.4E+02	7.2E+01
	3.9E+01	2.4E+01	1.3E+01	6.0E+00	5.4E+00	4.7E+00
	4.7E+00	4.1E+00	3.3E+00			
0714 351	1.3E+00	3.6E-01	9.5E-02	2.1E-02	6.4E-03	4.4E-03
ASSP 4	1.0E+01	7.5E+01	1.2E+02	1.6E+02	1.6E+02	7.6E+01
	3.8E+01	2.2E+01	1.2E+01	6.1E+00	5.1E+00	3.9E+00
	3.7E+00	4.1E+00	3.3E+00			
0715 394	1.9E+00	3.7E-01	7.3E-02	2.5E-02	8.2E-03	5.8E-03
ASSP 4	1.5E+01	7.8E+01	1.2E+02	1.8E+02	1.8E+02	8.6E+01
	4.1E+01	2.3E+01	1.3E+01	6.5E+00	5.2E 00	3.9E+00
	4.4E+00	3.7E+00	3.2E+00			
0716 380	1.5E+00	3.5E-01	9.5E-02	2.5E-02	1.8E-02	5.6E-03
ASSP 4	3.9E+01	9.2E+01	1.2E+02	1.5E+02	1.5E+02	7.9E+01
	4.4E+01	2.6E+01	1.5E+01	8.1E+00	6.1E+00	6.0E+00
	5.3E+00	4.5E+00	3.9E+00			
0717 396	1.4E+00	3.4E-01	7.2E-02	2.5E-02	1.4E-02	5.2E-03
ASSP 4	2.2E+01	6.0E+01	8.5E+01	1.1E+02	1.2E+02	7.5E+01
	4.4E+01	2.6E+01	1.6E+01	6.9E+00	5.2E+00	4.5E+00
	5.1E+00	4.3E+00	3.7E+00			

0729 539	1.1E+00	2.7E-01	9.9E-02	3.5E-02	2.6E-02	9.1E-03
ASSP 4	2.0E+00	1.5E+01	2.9E+01	4.3E+01	6.1E+01	5.5E+01
	4.3E+01	2.9E+01	1.7E+01	7.2E+00	4.4E+00	4.1E+00
	3.7E+00	4.2E+00	3.2E+00			
0730 522	1.3E+00	3.3E-01	1.0E-01	3.4E-02	1.6E-02	7.1E-03
ASSP 4	1.4E+00	1.2E+01	3.0E+01	4.5E+01	6.6E+01	5.3E+01
	3.7E+01	2.4E+01	1.6E+01	6.8E+00	4.5E+00	3.8E+00
	3.8E+00	3.2E+00	3.0E+00			
0731 520	1.1E+00	3.3E-01	1.1E-01	2.7E-02	2.1E-02	1.1E-02
ASSP 4	1.5E+00	1.4E+01	3.0E+01	4.3E+01	6.4E+01	5.3E+01
	3.9E+01	2.4E+01	1.5E+01	6.1E+00	4.0E+00	3.4E+00
	3.2E+00	2.9E+00	2.3E+00			
0744 507	1.0E+00	3.2E-01	8.7E-02	1.0E-02	9.7E-04	9.5E-04
ASSP 4	5.0E+00	5.7E+01	1.2E+02	2.2E+02	2.2E+01	1.2E+02
	4.0E+01	2.3E+01	1.3E+01	5.7E+00	4.6E+00	4.1E+00
	3.5E+00	3.4E+00	2.9E+00			
0745 546	1.2E+00	3.9E-01	9.3E-02	9.1E-03	1.4E-03	5.3E-04
ASSP 4	5.4E+00	6.1E+01	1.3E+02	2.3E+02	3.3E+01	1.1E+02
	4.4E+01	2.4E+01	1.2E+01	5.6E+00	4.5E+00	3.7E+00
	3.6E+00	2.8E+00	2.4E+00			
0746 548	1.3E+00	3.1E-01	6.8E-02	4.6E-03	1.9E-03	1.1E-03
ASSP 4	6.3E+00	6.3E+01	1.3E+02	2.3E+02	2.6E+01	1.1E+02
	3.8E+01	2.0E+01	1.1E+01	5.2E+00	4.2E+00	3.8E+00
	3.6E+00	3.0E+00	2.2E+00			
0759 1010	5.7E-01	2.3E-01	3.8E-02	2.3E-03	6.3E-04	2.3E-04
ASSP 4	7.4E+00	7.7E+01	1.1E+02	1.7E+02	1.5E+02	4.5E+01
	3.4E+01	1.5E+01	3.5E+00	1.9E+00	1.8E+00	1.5E+00
	1.2E+00	7.4E-01	6.1E-01			
0800 994	9.8E-01	2.4E-01	3.3E-02	3.3E-03	9.5E-04	2.3E-04
ASSP 4	1.2E+01	7.9E+01	1.1E+02	1.7E+02	1.3E+02	4.1E+01
	2.9E+01	1.3E+01	3.0E+00	2.1E+00	2.0E+00	1.6E+00
	1.3E+00	8.1E-01	7.6E-01			
0801 1092	7.6E-01	2.5E-01	2.8E-02	9.9E-04	0.0E-01	0.0E-01
ASSP 4	2.8E+01	1.0E+02	1.2E+02	1.7E+02	1.2E+02	4.3E+01
	2.8E+01	1.2E+01	4.1E+00	2.3E+00	2.4E+00	1.5E+00
	1.4E+00	1.1E+00	7.1E-01			
0814 695	9.4E-01	3.1E-01	1.6E-02	4.8E-04	3.2E-04	0.0E-01
ASSP 4	5.7E+01	1.1E+02	1.1E+02	1.3E+02	1.1E+02	6.7E+01
	4.8E+01	2.2E+01	4.1E+00	2.8E+00	2.4E+00	2.0E+00
	2.2E+00	1.5E+00	1.1E+00			
0815 818	1.1E+00	2.6E-01	2.7E-02	2.8E-03	2.7E-04	0.0E-01
ASSP 4	5.3E+01	1.1E+02	1.1E+02	1.3E+02	1.1E+02	6.7E+01
	4.8E+01	2.2E+01	6.0E+00	3.8E+00	3.4E+00	2.9E+00
	2.1E+00	1.4E+00	1.6E+00			
0816 712	9.3E-01	3.3E-01	2.4E-02	1.7E-03	0.0E-01	0.0E-01
ASSP 4	1.8E+02	1.7E+02	1.5E+02	1.5E+02	1.2E+02	6.8E+01
	4.6E+01	2.0E+01	6.0E+00	3.7E+00	3.1E+00	2.4E+00
	2.3E+00	2.0E+00	1.2E+00			

0817 744	8.3E-01	3.0E-01	2.7E-02	3.1E-03	6.0E-04	0.0E-01
ASSP 4	2.6E+02	2.0E+02	1.7E+02	1.6E+02	1.2E+02	6.8E+01
	4.9E+01	2.0E+01	6.7E+00	3.5E+00	2.9E+00	2.4E+00
	2.1E+00	1.6E+00	1.2E+00			
0818 814	5.5E-01	2.7E-01	3.1E-02	2.6E-03	8.8E-04	0.0E-01
ASSP 4	2.2E+02	2.0E+02	1.6E+02	1.6E+02	1.3E+02	6.9E+01
	4.7E+01	2.1E+01	7.3E+00	4.0E+00	3.3E+00	2.9E+00
	2.2E+00	1.5E+00	1.1E+00			
0819 734	1.1E+00	2.7E-01	3.6E-02	4.6E-04	3.1E-04	0.0E-01
ASSP 4	2.3E+02	2.1E+02	1.7E+02	1.7E+02	1.1E+02	5.6E+01
	3.9E+01	1.6E+01	5.8E+00	3.5E+00	3.4E+00	2.6E+00
	2.6E+00	1.7E+00	1.5E+00			
0820 807	5.1E-01	2.9E-01	3.4E-02	1.7E-03	5.9E-04	2.2E-04
ASSP 4	1.7E+02	1.9E+02	1.6E+02	1.6E+02	1.2E+02	6.5E+01
	4.7E+01	1.8E+01	7.6E+00	3.3E+00	3.3E+00	2.5E+00
	2.3E+00	1.9E+00	1.5E+00			
0821 964	5.4E-01	2.7E-01	3.0E-02	2.1E-03	2.8E-04	0.0E-01
ASSP 4	4.7E+01	1.2E+02	1.3E+02	1.7E+02	1.4E+02	5.8E+01
	4.3E+01	1.9E+01	6.7E+00	4.7E+00	3.8E+00	3.5E+00
	3.1E+00	2.6E+00	1.9E+00			
0822 847	6.2E-01	2.3E-01	2.7E-02	1.2E-03	0.0E-01	0.0E-01
ASSP 4	2.2E+01	9.2E+01	1.2E+02	1.6E+02	1.4E+02	5.3E+01
	3.6E+01	1.8E+01	5.5E+00	3.8E+00	3.0E+00	2.8E+00
	2.4E+00	2.3E+00	2.0E+00			
0823 944	7.2E-01	2.1E-01	3.0E-02	8.2E-04	0.0E-01	2.0E-04
ASSP 4	1.2E+01	8.9E+01	1.2E+02	1.6E+02	1.3E+02	5.5E+01
	3.9E+01	1.9E+01	6.6E+00	4.0E+00	3.2E+00	2.9E+00
	2.5E+00	2.1E+00	1.9E+00			
0824 886	6.1E-01	1.9E-01	2.5E-02	1.6E-03	2.8E-04	0.0E-01
ASSP 4	1.2E+01	8.1E+01	1.1E+02	1.5E+02	1.3E+02	6.0E+01
	4.3E+01	2.0E+01	6.8E+00	3.5E+00	3.4E+00	2.9E+00
	2.5E+00	1.8E+00	1.7E+00			
0825 795	7.3E-01	2.5E-01	4.4E-02	3.7E-03	5.6E-04	2.1E-04
ASSP 4	1.7E+01	7.7E+01	9.9E+01	1.3E+02	1.3E+02	7.0E+01
	5.1E+01	2.5E+01	9.6E+00	4.6E+00	3.9E+00	3.5E+00
	3.5E+00	2.8E+00	2.3E+00			
0826 819	7.5E-01	2.4E-01	4.5E-02	2.0E-03	5.4E-04	0.0E-01
ASSP 4	2.3E+01	7.8E+01	1.0E+02	1.4E+02	1.3E+02	6.3E+01
	4.4E+01	2.4E+01	9.3E+00	4.5E+00	4.0E+00	3.7E+00
	3.3E+00	2.4E+00	2.0E+00			
0827 863	1.1E+00	2.3E-01	5.9E-02	2.6E-03	1.7E-03	0.0E-01
ASSP 4	1.7E+01	7.0E+01	9.5E+01	1.3E+02	1.3E+02	6.6E+01
	5.3E+01	2.6E+01	8.8E+00	4.0E+00	4.1E+00	3.4E+00
	3.1E+00	2.0E+00	1.8E+00			
0828 879	7.7E-01	2.4E-01	5.9E-02	4.6E-03	8.4E-04	6.2E-04
ASSP 4	2.6E+01	7.8E+01	9.7E+01	1.3E+02	1.2E+02	6.5E+01
	4.8E+01	2.5E+01	9.0E+00	4.5E+00	4.3E+00	3.4E+00
	3.4E+00	2.7E+00	2.1E+00			
0829 757	1.0E+00	2.3E-01	6.6E-02	6.5E-03	1.2E-03	0.0E-01
ASSP 4	2.1E+01	7.6E+01	9.3E+01	1.3E+02	1.2E+02	6.2E+01
	4.9E+01	2.3E+01	9.0E+00	4.5E+00	4.0E+00	3.5E+00
	3.3E+00	2.5E+00	1.8E+00			
0830 800	8.8E-01	2.5E-01	7.8E-02	7.5E-03	1.1E-03	2.1E-04
ASSP 4	4.4E+01	9.5E+01	1.0E+02	1.3E+02	1.2E+02	5.8E+01
	4.4E+01	2.2E+01	8.5E+00	4.1E+00	4.1E+00	4.0E+00
	2.6E+00	2.5E+00	1.8E+00			

Fog $4C_2$. August 4 (Day216) 1975

DAY 216 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = OAP LINES 2,3&4 = ASSP

0900 2591	5.8E-01	2.9E-01	4.1E-02	7.7E-03	4.6E-03	3.2E-03
ASSP 4	1.1E+01	3.7E+01	4.5E+01	5.6E+01	4.8E+01	1.6E+01
	1.1E+01	6.7E+00	3.0E+00	2.2E+00	1.7E+00	1.6E+00
	1.6E+00	9.9E-01	7.9E-01			
0901 2148	1.0E+00	2.9E-01	4.1E-02	1.4E-02	7.4E-03	5.9E-03
ASSP 4	2.1E+01	4.1E+01	4.5E+01	5.4E+01	4.4E+01	2.0E+01
	1.6E+01	8.3E+00	3.8E+00	2.7E+00	2.5E+00	2.3E+00
	2.0E+00	1.1E+00	8.4E-01			
0914 2403	7.3E-01	2.0E-01	4.0E-02	6.6E-03	1.0E-02	6.4E-03
ASSP 4	1.2E+01	3.9E+01	4.8E+01	6.1E+01	5.3E+01	2.1E+01
	1.6E+01	8.9E+00	3.7E+00	2.4E+00	2.3E+00	2.3E+00
	1.5E+00	1.0E+00	6.3E-01			
0915 1418	2.0E-01	1.7E-01	4.5E-02	7.5E-03	7.6E-03	7.2E-03
ASSP 4	5.1E+00	3.1E+01	4.0E+01	5.9E+01	5.5E+01	2.1E+01
	1.6E+01	9.4E+00	4.0E+00	3.4E+00	2.5E+00	2.1E+00
	1.9E+00	1.5E+00	1.0E+00			
0916 1612	2.1E-01	1.5E-01	2.3E-02	1.1E-02	5.3E-03	3.4E-03
ASSP 4	1.0E+01	3.2E+01	4.0E+01	5.7E+01	5.8E+01	3.0E+01
	2.2E+01	1.4E+01	6.1E+00	4.0E+00	3.6E+00	3.0E+00
	2.7E+00	2.0E+00	1.5E+00			
0929 2047	2.3E+00	4.6E-01	6.1E-02	6.6E-03	2.2E-03	1.4E-03
ASSP 4	1.8E+02	8.9E+01	8.1E+01	7.6E+01	5.8E+01	3.2E+01
	2.2E+01	1.0E+01	5.4E+00	4.2E+00	3.5E+00	3.0E+00
	2.4E+00	2.1E+00	1.5E+00			
0930 2838	1.3E+00	3.7E-01	3.9E-02	4.1E-03	5.0E-04	1.9E-04
ASSP 4	1.2E+02	8.4E+01	8.0E+01	7.9E+01	6.1E+01	3.3E+01
	2.2E+01	1.1E+01	5.1E+00	4.6E+00	3.9E+00	3.0E+00
	2.3E+00	1.7E+00	1.5E+00			
0931 2192	1.8E+00	4.5E-01	4.7E-02	4.9E-03	2.3E-03	3.8E-04
ASSP 4	3.5E+02	1.0E+02	8.4E+01	8.0E+01	6.1E+01	3.2E+01
	2.3E+01	1.1E+01	5.7E+00	4.0E+00	3.7E+00	2.7E+00
	2.7E+00	1.8E+00	1.3E+00			
0944 2680	1.3E-01	1.1E-01	2.1E-02	9.9E-03	1.6E-03	3.4E-04
ASSP 4	7.6E+01	7.3E+01	7.8E+01	8.9E+01	8.4E+01	4.5E+01
	3.5E+01	1.7E+01	9.6E+00	6.8E+00	5.7E+00	5.3E+00
	4.6E+00	2.8E+00	2.2E+00			
0945 2910	0.0E-01	1.1E-01	1.8E-02	4.5E-03	7.6E-04	0.0E-01
ASSP 4	4.1E+01	5.2E+01	6.2E+01	8.3E+01	8.1E+01	4.7E+01
	3.5E+01	1.9E+01	9.5E+00	7.1E+00	6.7E+00	5.9E+00
	4.1E+00	3.3E+00	1.9E+00			
0946 3571	1.0E-01	8.5E-02	1.5E-02	2.4E-03	8.0E-04	0.0E-01
ASSP 4	1.0E+01	3.2E+01	5.1E+01	7.5E+01	7.4E+01	4.1E+01
	3.5E+01	1.8E+01	9.2E+00	8.4E+00	7.5E+00	6.3E+00
	5.0E+00	3.4E+00	2.1E+00			

0947 2541	1.7E-01	9.1E-02	3.1E-03	4.3E-03	7.9E-04	5.8E-04
ASSP 4	7.2E+00	2.6E+01	4.5E+01	6.7E+01	7.1E+01	4.5E+01
	3.9E+01	2.0E+01	1.1E+01	8.7E+00	8.7E+00	6.7E+00
	5.3E+00	3.6E+00	2.4E+00			
0948 3120	1.2E-01	6.8E-02	1.0E-02	1.8E-03	1.2E-03	1.8E-04
ASSP 4	6.0E+00	3.1E+01	5.0E+01	7.5E+01	7.8E+01	4.8E+01
	3.9E+01	1.9E+01	8.6E+00	7.7E+00	6.3E+00	5.5E+00
	4.2E+00	2.8E+00	2.1E+00			
0949 1567	2.1E-01	6.3E-02	2.3E-03	2.0E-03	0.0E-01	0.0E-01
ASSP 4	1.4E+01	4.0E+01	5.8E+01	8.2E+01	7.6E+01	3.2E+01
	3.0E+01	1.5E+01	7.7E+00	6.2E+00	5.4E+00	4.1E+00
	3.8E+00	2.9E+00	2.2E+00			
0950 1594	5.2E-02	6.3E-02	1.9E-03	4.9E-04	3.3E-04	2.4E-04
ASSP 4	6.5E+01	6.6E+01	6.9E+01	8.4E+01	7.5E+01	4.0E+01
	2.9E+01	1.4E+01	7.9E+00	4.9E+00	5.5E+00	4.8E+00
	4.1E+00	3.1E+00	2.4E+00			
0951 7358	7.9E-02	4.9E-02	2.8E-03	9.9E-04	3.3E-04	0.0E-01
ASSP 4	1.3E+01	3.6E+01	5.1E+01	7.2E+01	7.1E+01	3.7E+01
	2.9E+01	1.6E+01	7.4E+00	5.0E+00	4.4E+00	3.8E+00
	3.3E+00	2.7E+00	2.1E+00			
0952 1200	1.0E-01	4.9E-02	3.7E-03	0.0E-01	0.0E-01	4.9E-04
ASSP 4	2.4E+00	2.2E+01	4.0E+01	6.5E+01	6.9E+01	4.0E+01
	3.1E+01	1.7E+01	8.3E+00	4.8E+00	4.7E+00	4.0E+00
	3.6E+00	2.8E+00	2.2E+00			
0953 1128	7.6E-02	3.6E-02	4.5E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.0E+00	2.4E+01	3.7E+01	5.7E+01	6.0E+01	3.2E+01
	2.6E+01	1.6E+01	6.4E+00	4.5E+00	4.2E+00	3.9E+00
	3.5E+00	2.6E+00	2.3E+00			
0954 914	1.1E-01	2.1E-02	2.9E-03	5.0E-04	6.8E-04	0.0E-01
ASSP 4	2.9E+00	2.1E+01	3.6E+01	5.9E+01	6.4E+01	3.9E+01
	3.4E+01	2.0E+01	9.2E+00	5.5E+00	5.6E+00	4.4E+00
	4.7E+00	3.5E+00	2.4E+00			
0955 778	8.2E-02	5.4E-02	2.9E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.4E+00	3.2E+01	4.0E+01	6.5E+01	6.6E+01	4.0E+01
	3.1E+01	1.7E+01	8.0E+00	6.2E+00	5.3E+00	4.7E+00
	4.0E+00	2.9E+00	2.0E+00			
0956 979	1.1E-01	3.1E-02	4.0E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+00	2.4E+01	3.4E+01	6.0E+01	6.5E+01	5.0E+01
	4.0E+01	2.2E+01	9.3E+00	7.2E+00	6.4E+00	5.3E+00
	4.6E+00	2.9E+00	2.3E+00			
0957 935	4.9E-02	3.5E-02	7.0E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+01	3.1E+01	4.1E+01	6.6E+01	6.9E+01	4.5E+01
	3.8E+01	2.1E+01	9.1E+00	7.6E+00	7.2E+00	5.5E+00
	4.2E+00	3.5E+00	2.4E+00			
0958 1199	1.1E-01	5.0E-02	5.1E-03	0.0E-01	0.0E 01	0.0E-01
ASSP 4	1.7E+01	4.0E+01	4.6E+01	7.1E+01	7.0E+01	4.1E+01
	3.4E+01	2.0E+01	9.4E+00	7.8E+00	6.8E+00	5.4E+00
	4.5E+00	3.6E+00	2.2E+00			
0959 1101	1.2E-01	5.3E-02	5.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+01	3.8E+01	4.5E+01	7.1E+01	7.5E+01	4.4E+01
	3.7E+01	2.1E+01	9.7E+00	7.4E+00	6.8E+00	5.6E+00
	4.6E+00	3.4E+00	2.1E+00			
1000 776	2.7E-01	7.0E-02	2.2E-03	1.1E-03	0.0E-01	0.0E-01
ASSP 4	3.8E+01	4.6E+01	5.2E+01	7.1E+01	7.2E+01	4.8E+01
	3.8E+01	2.0E+01	1.1E+01	7.6E+00	7.3E+00	6.0E+00
	5.0E+00	3.3E+00	2.1E+00			

Fog $4C_4$. August 4 (Day 216) 1975

DAY 216	NUMBER DENSITY (NO./CC/MICRON)					
HOUR VISBY	1ST LINE = DAP	LINES 2,3&4 = ASSP				
1210 1709	5.7E-02	4.4E-02	6.8E-04	1.1E-03	2.4E-04	0.0E-01
ASSP 4	4.7E-01	7.7E+00	2.1E+01	3.4E+01	5.3E+01	4.3E+01
	1.8E+01	1.1E+01	8.0E+00	4.5E+00	3.2E+00	2.8E+00
	2.3E+00	2.2E+00	2.0E+00			
1211 1490	3.7E-02	2.0E-02	1.3E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E-01	8.4E+00	2.3E+01	3.8E+01	5.6E+01	3.7E+01
	1.4E+01	8.5E+00	5.6E+00	3.1E+00	2.4E+00	2.3E+00
	2.1E+00	1.9E+00	1.5E+00			
1212 1695	5.1E-02	1.7E-02	1.2E-03	6.4E-04	0.0E-01	0.0E-01
ASSP 4	8.5E-01	7.2E+00	2.2E+01	3.9E+01	5.7E+01	4.2E+01
	1.5E+01	8.0E+00	5.1E+00	3.1E+00	2.4E+00	1.7E+00
	2.1E+00	1.4E+00	1.1E+00			
1213 2012	1.4E-01	3.2E-02	3.5E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E-01	8.6E+00	2.3E+01	3.9E+01	5.8E+01	4.1E+01
	1.2E+01	8.2E+00	5.9E+00	3.1E+00	2.7E+00	2.3E+00
	2.5E+00	1.7E+00	1.7E+00			
1214 1812	9.6E-02	2.9E-02	2.7E-03	3.6E-04	0.0E-01	1.8E-04
ASSP 4	6.1E-01	8.2E+00	2.2E+01	3.9E+01	5.4E+01	4.0E+01
	1.3E+01	8.1E+00	5.7E+00	3.4E+00	2.8E+00	2.6E+00
	2.6E+00	2.5E+00	2.0E+00			
1215 1492	8.7E-02	4.8E-02	7.0E-03	8.2E-04	0.0E-01	6.1E-04
ASSP 4	7.1E-01	9.0E+00	2.5E+01	3.8E+01	5.4E+01	4.0E+01
	1.5E+01	9.7E+00	6.6E+00	3.8E+00	2.7E+00	2.8E+00
	2.4E+00	2.0E+00	1.8E+00			
1229 2416	6.9E-02	4.2E-02	1.8E-02	3.6E-03	1.3E-03	1.6E-04
ASSP 4	1.7E+00	1.6E+01	3.3E+01	5.5E+01	6.1E+01	2.1E+01
	1.0E+01	5.3E+00	3.3E+00	2.0E+00	2.3E+00	1.5E+00
	1.5E+00	1.4E+00	9.9E-01			
1230 1816	1.1E-01	4.4E-02	9.8E-03	2.4E-03	2.1E-03	0.0E-01
ASSP 4	2.0E+00	1.5E+01	3.2E+01	5.2E+01	5.9E+01	2.4E+01
	1.2E+01	7.6E+00	4.1E+00	2.5E+00	2.4E+00	2.0E+00
	1.9E+00	1.4E+00	9.4E-01			
1231 1624	8.7E-02	6.7E-02	1.2E-02	5.6E-03	8.8E-04	0.0E-01
ASSP 4	3.2E+00	1.5E+01	3.1E+01	4.9E+01	5.7E+01	2.5E+01
	1.4E+01	8.2E+00	4.3E+00	3.0E+00	2.9E+00	2.2E+00
	2.1E+00	1.4E+00	1.2E+00			
1244 1243	1.6E-01	6.6E-02	3.2E-03	3.4E-04	0.0E-01	0.0E-01
ASSP 4	7.9E+00	1.9E+01	3.0E+01	4.9E+01	5.8E+01	3.4E+01
	2.5E+01	1.5E+01	7.4E+00	3.9E+00	3.5E+00	3.0E+00
	3.1E+00	2.5E+00	1.8E+00			
1245 1097	1.5E-01	6.9E-02	4.1E-03	0.0E-01	2.4E-04	0.0E-01
ASSP 4	6.6E+00	1.9E+01	3.1E+01	4.5E+01	5.5E+01	3.4E+01
	2.7E+01	1.5E+01	7.7E+00	4.1E+00	3.3E+00	3.3E+00
	2.9E+00	2.1E+00	1.8E+00			
1246 1032	1.6E-01	6.6E-02	9.5E-03	1.7E-03	2.2E-04	3.3E-04
ASSP 4	3.7E+00	1.6E+01	2.9E+01	4.4E+01	5.6E+01	3.5E+01
	2.6E+01	1.4E+01	7.6E+00	4.2E+00	3.5E+00	3.1E+00
	2.8E+00	2.3E+00	1.5E+00			

1259 950	4.7E-01	3.0E-01	4.2E-02	2.0E-02	1.9E-02	2.0E-02
ASSP 4	3.6E+00	1.4E+01	2.4E+01	4.0E+01	5.3E+01	3.7E+01
	2.8E+01	1.6E+01	8.4E+00	4.3E+00	3.6E+00	3.6E+00
	3.3E+00	2.5E+00	2.2E+00			
1300 783	4.9E-01	2.5E-01	4.2E-02	1.7E-02	1.6E-02	1.2E-02
ASSP 4	3.4E+00	1.3E+01	2.6E+01	4.3E+01	5.6E+01	3.8E+01
	2.7E+01	1.6E+01	8.6E+00	3.8E+00	3.5E+00	2.7E+00
	2.7E+00	2.3E+00	2.1E+00			
1301 792	5.5E-01	2.2E-01	3.2E-02	1.1E-02	1.5E-02	1.1E-02
ASSP 4	1.5E+00	1.1E+01	2.2E+01	4.0E+01	5.4E+01	3.5E+01
	2.5E+01	1.4E+01	7.6E+00	3.6E+00	3.4E+00	3.1E+00
	3.0E+00	2.3E+00	1.9E+00			
1314 640	3.3E-01	1.6E-01	3.0E-02	2.0E-02	2.0E-02	1.7E-02
ASSP 4	3.5E+00	1.3E+01	2.2E+01	3.7E+01	5.3E+01	4.0E+01
	3.2E+01	1.9E+01	1.1E+01	5.2E+00	5.3E+00	4.2E+00
	4.2E+00	3.7E+00	2.5E+00			
1315 1219	4.0E-01	1.6E-01	2.4E-02	2.3E-02	1.7E-02	1.1E-02
ASSP 4	1.5E+00	1.1E+01	2.2E+01	3.7E+01	5.3E+01	3.8E+01
	3.1E+01	1.8E+01	1.0E+01	5.0E+00	4.9E+00	4.2E+00
	3.6E+00	3.5E+00	2.5E+00			
1316 998	2.9E-01	1.3E-01	3.1E-02	2.0E-02	2.1E-02	1.3E-02
ASSP 4	2.2E+00	1.2E+01	2.1E+01	3.8E+01	5.5E+01	3.6E+01
	3.0E+01	1.9E+01	1.0E+01	5.4E+00	5.3E+00	3.8E+00
	3.8E+00	3.6E+00	2.3E+00			
1329 798	1.8E-01	1.8E-01	6.2E-02	3.0E-02	1.8E-02	1.0E-02
ASSP 4	3.5E+00	1.7E+01	2.4E+01	4.1E+01	5.7E+01	3.9E+01
	3.1E+01	1.9E+01	9.5E+00	4.8E+00	4.5E+00	3.7E+00
	3.6E+00	3.3E+00	3.0E+00			
1330 640	4.0E-01	1.9E-01	5.2E-02	3.0E-02	1.9E-02	1.1E-02
ASSP 4	5.1E+00	1.7E+01	2.7E+01	4.2E+01	5.7E+01	4.1E+01
	3.3E+01	2.0E+01	1.0E+01	5.4E+00	4.6E+00	4.2E+00
	4.0E+00	3.1E+00	2.7E+00			
1331 663	2.0E-01	1.7E-01	6.1E-02	3.3E-02	2.2E-02	9.2E-03
ASSP 4	4.4E+00	1.5E+01	2.5E+01	4.0E+01	5.6E+01	4.2E+01
	3.4E+01	1.9E+01	1.1E+01	5.2E+00	4.5E+00	3.7E+00
	4.0E+00	3.2E+00	2.5E+00			
1344 677	1.3E+00	2.0E-01	3.2E-02	3.2E-03	1.1E-03	2.0E-04
ASSP 4	2.1E+01	3.3E+01	4.1E+01	5.9E+01	6.6E 01	4.7E+01
	3.7E+01	1.7E+01	8.5E+00	6.1E+00	5.5E+00	4.9E+00
	4.2E+00	3.3E+00	2.7E+00			
1345 563	8.2E-01	2.1E-01	3.0E-02	4.5E-03	0.0E-01	0.0E-01
ASSP 4	1.8E+01	3.1E+01	3.8E+01	6.0E+01	6.3E+01	4.4E+01
	3.4E+01	1.7E+01	7.5E+00	5.8E+00	5.4E+00	4.9E+00
	3.9E+00	3.1E+00	2.3E+00			
1346 672	1.0E+00	2.4E-01	3.9E-02	3.9E-03	8.8E-04	0.0E-01
ASSP 4	2.1E+01	3.3E+01	4.0E+01	6.2E+01	6.8E+01	4.4E+01
	3.4E+01	1.7E+01	8.2E+00	5.8E+00	5.5E+00	4.8E+00
	4.0E+00	3.3E+00	2.5E+00			

1399 552	[illegible]	4.[illegible]-01	5.1E-02	4.2E-03	1.9E-03	1.2E-03
ACSP 4	5.[illegible]+00	2.2E+01	3.4E+01	5.7E+01	6.[illegible]E+01	3.6E+01
	2.7E+01	1.[illegible]+01	6.5E+00	4.4E+00	4.3E+00	3.6E+00
	3.9E+00	3.[illegible]E+00	2.7E+00			
1400 594	1.[illegible]+00	4.5E-01	5.0E-02	5.8E-03	6.5E-04	7.2E-04
ACSP 4	5.8E+00	2.2E+01	3.2E+01	5.2E+01	6.1E+01	3.9E+01
	3.0E+01	1.7E+01	7.6E+00	4.2E+00	4.5E+00	4.0E+00
	3.6E+00	3.2E+00	2.8E+00			
1401 517	1.5E+00	4.5E-01	4.8E-02	5.7E-03	1.9E-03	1.7E-03
ACSP 4	8.1E+00	2.5E+01	3.6E+01	5.8E+01	6.8E+01	3.7E+01
	2.8E+01	1.5E+01	7.6E+00	4.3E+00	3.9E+00	4.0E+00
	3.2E+00	3.3E+00	2.7E+00			

1414 557	2.1E+00	6.3E-01	9.3E-02	1.4E-02	8.3E-03	3.0E-03
ACSP 4	5.1E+00	2.9E+01	4.0E+01	6.4E+01	6.7E+01	5.3E+01
	3.9E+01	1.4E+01	6.1E+00	5.0E+00	4.5E+00	4.0E+00
	2.9E+00	2.1E+00	1.8E+00			
1415 572	1.2E+00	4.7E-01	9.5E-02	9.4E-03	8.7E-03	2.0E-03
ACSP 4	6.0E+00	3.1E+01	4.4E+01	6.9E+01	6.4E+01	5.0E+01
	3.6E+01	1.4E+01	5.0E+00	4.3E+00	4.1E+00	3.5E+00
	2.5E+00	2.1E+00	1.9E+00			
1416 620	9.5E-01	4.4E-01	7.0E-02	1.5E-02	6.2E-03	1.9E-03
ACSP 4	5.6E+00	3.3E+01	4.5E+01	7.4E+01	6.4E+01	4.3E+01
	3.4E+01	1.2E+01	4.6E+00	4.4E+00	3.9E+00	3.3E+00
	2.7E+00	2.1E+00	1.5E+00			

1430 515	1.4E+00	3.0E-01	6.8E-02	1.3E-02	9.6E-03	3.3E-03
ACSP 4	9.8E+00	4.2E+01	6.2E+01	9.0E+01	6.7E+01	5.1E+01
	3.5E+01	1.3E+01	7.0E+00	5.8E+00	5.4E+00	4.5E+00
	3.7E+00	3.2E+00	2.7E+00			
1431 497	1.7E+00	3.3E-01	5.7E-02	9.4E-03	6.0E-03	2.0E-03
ACSP 4	9.8E+00	4.2E+01	5.5E+01	8.5E+01	7.5E+01	6.3E+01
	4.3E+01	1.5E+01	7.6E+00	6.9E+00	6.1E+00	5.0E+00
	3.6E+00	3.3E+00	2.4E+00			
1432 525	9.3E-01	3.0E-01	4.7E-02	8.9E-03	5.4E-03	2.4E-03
ACSP 4	4.2E+01	6.7E+01	6.9E+01	9.4E+01	7.9E+01	5.8E+01
	4.1E+01	1.5E+01	7.9E+00	6.2E+00	6.4E+00	5.0E+00
	4.3E+00	3.3E+00	2.5E+00			
1433 659	1.1E+00	2.4E-01	5.2E-02	6.8E-03	6.3E-03	3.6E-03
ACSP 4	3.3E+01	5.7E+01	6.5E+01	8.7E+01	7.9E+01	6.1E+01
	4.4E+01	1.7E+01	8.1E+00	6.2E+00	6.1E+00	5.4E+00
	4.4E+00	3.1E				

1438 866	4.0E-01	1.3E-01	2.3E-02	2.1E-03	2.8E-04	6.3E-04
ASSP 4	7.6E+00	4.3E+01	6.9E+01	8.3E+01	6.6E+01	5.1E+01
	2.6E+01	8.4E+00	6.4E+00	5.3E+00	4.4E+00	3.3E+00
	2.3E+00	1.9E+00	1.6E+00			
1439 1152	3.8E-01	9.3E-02	2.0E-02	4.0E-04	2.7E-04	4.0E-04
ASSP 4	1.5E+01	6.5E+01	1.2E+02	8.1E+01	4.4E+01	3.2E+01
	1.3E+01	7.7E+00	6.3E+00	4.3E+00	3.2E+00	2.2E+00
	1.7E+00	1.3E+00	1.2E+00			
1440 1574	1.9E-01	6.1E-02	8.9E-03	0.0E-01	4.8E-04	1.8E-04
ASSP 4	6.5E+01	1.3E+02	1.1E+01	5.1E+01	2.3E+01	1.4E+01
	8.9E+00	5.9E+00	4.7E+00	2.7E+00	2.1E+00	1.1E+00
	9.5E-01	8.0E-01	4.2E-01			
1441 2624	0.0E-01	2.3E-02	1.0E-02	7.3E-04	0.0E-01	1.8E-04
ASSP 4	3.5E+02	1.8E+02	1.1E+02	2.3E+01	1.2E+01	6.2E+00
	4.3E+00	2.8E+00	1.5E+00	8.0E-01	4.4E-01	1.8E-01
	1.7E-01	1.3E-01	1.2E-01			
1442 1406	8.0E-02	1.1E-02	7.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.4E+02	9.2E+01	2.7E+01	1.0E+01	6.1E+00	2.9E+00
	1.7E+00	7.0E-01	2.0E-01	1.4E-01	6.1E-02	6.1E-02
	2.0E-02	2.0E-02	0.0E-01			
1443 3118	2.0E-02	1.6E-02	1.3E-02	1.5E-03	1.3E-03	0.0E-01
ASSP 4	4.4E+02	4.7E+01	1.3E+01	4.4E+00	1.9E+00	1.1E+00
	4.2E-01	2.1E-01	6.5E-02	3.0E-02	2.0E-02	0.0E-01
	0.0E-01	0.0E-01	1.0E-02			
1444 2768	7.0E-02	2.9E-02	8.1E-03	1.3E-03	8.9E-04	0.0E-01
ASSP 4	2.0E+02	6.7E+01	4.9E+00	1.4E+00	8.3E-01	1.4E-01
	6.3E-02	2.4E-02	0.0E-01	1.0E-02	1.0E-02	0.0E-01
	1.0E-02	0.0E-01	0.0E-01			
1445 3400	1.6E-01	1.6E-02	1.1E-02	2.4E-03	4.6E-04	3.4E-04
ASSP 4	1.7E+02	4.9E+01	1.8E+00	7.4E-01	1.3E-01	4.7E-02
	1.6E-02	1.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1446 2581	9.2E-02	3.8E-02	9.8E-03	3.1E-03	2.3E-03	2.9E-03
ASSP 4	3.6E+02	9.2E+01	2.4E+00	9.3E-01	1.7E-01	7.9E-02
	0.0E-01	1.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1447 3286	1.1E-01	5.2E-02	1.4E-02	2.0E-03	2.3E-03	1.9E-03
ASSP 4	4.4E+02	1.2E+02	2.7E+00	1.1E+00	1.7E-01	6.3E-02
	3.1E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1448 3861	1.2E-01	4.5E-02	1.6E-02	4.0E-03	3.5E-03	3.1E-03
ASSP 4	2.9E+02	1.1E+02	3.1E+00	8.5E-01	1.7E-01	6.3E-02
	0.0E-01	0.0E-01	0.0E-01	0.0E-01	1.0E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1449 4637	1.1E-01	2.5E-02	7.6E-03	2.0E-03	1.8E-03	1.5E-03
ASSP 4	2.4E+02	1.8E+02	2.8E+00	8.0E-01	2.5E-01	1.3E-01
	1.6E-02	2.4E-02	1.1E-02	1.0E-02	1.0E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1450 4092	5.2E-02	3.6E-02	7.4E-03	3.9E-03	4.0E-03	1.3E-03
ASSP 4	6.2E+01	6.7E+01	3.9E+00	1.4E+00	2.0E-01	7.9E-02
	1.6E-02	2.4E-02	0.0E-01	1.0E-02	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			

Fog 9. August 7 (Day 219) 1975

DAY 219 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

0225 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+01	4.5E+01	2.7E+01	2.0E+01	1.0E+01	4.2E+00
	1.7E+00	5.2E-01	3.2E-01	3.0E-01	2.2E-01	1.1E-01
	3.7E-02	0.0E-01	0.0E-01			
0226 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.8E+01	3.7E+01	2.0E+01	1.3E+01	9.3E+00	2.9E+00
	1.1E+00	3.9E-01	2.8E-01	3.0E-01	1.5E-01	7.5E-02
	3.7E-02	3.7E-02	3.7E-02			
0227 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	3.9E+01	2.4E+01	1.5E+01	1.0E+01	3.7E+00
	1.2E+00	7.0E-01	5.6E-01	7.5E-02	1.1E-01	1.1E-01
	1.1E-01	7.5E-02	0.0E-01			
0228 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.3E+01	3.8E+01	2.2E+01	1.4E+01	1.0E+01	3.3E+00
	6.4E-01	4.8E-01	2.4E-01	2.6E-01	3.7E-02	0.0E-01
	0.0E-01	0.0E-01	3.7E-02			
0229 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.9E+01	5.4E+01	3.1E+01	2.2E+01	1.5E+01	4.3E+00
	1.4E+00	6.6E-01	4.8E-01	2.2E-01	0.0E-01	3.7E-02
	1.1E-01	0.0E-01	0.0E-01			
0230 9999	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.2E+01	5.7E+01	3.1E+01	2.0E+01	1.5E+01	5.9E+00
	1.1E+00	5.2E-01	2.8E-01	2.6E-01	1.1E-01	3.7E-02
	3.7E-02	0.0E-01	0.0E-01			
0231 9924	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.3E+01	8.1E+01	4.9E+01	3.1E+01	2.1E+01	6.4E+00
	1.2E+00	7.9E-01	3.2E-01	1.1E-01	2.2E-01	0.0E-01
	0.0E-01	7.5E-02	3.7E-02			
0232 9387	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.7E+02	1.1E+02	7.3E+01	4.7E+01	1.4E+01
	1.5E+00	7.9E-01	4.4E-01	2.2E-01	1.1E-01	7.5E-02
	7.5E-02	0.0E-01	7.5E-02			
0233 7975	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+02	2.0E+02	1.5E+02	1.0E+02	6.7E+01	2.8E+01
	2.0E+00	9.6E-01	4.8E-01	2.2E-01	2.2E-01	0.0E-01
	3.7E-02	7.5E-02	3.7E-02			
0234 8176	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+02	1.8E+02	1.2E+02	9.2E+01	5.6E+01	2.5E+01
	2.9E+00	7.0E-01	7.7E-01	2.6E-01	7.5E-02	7.5E-02
	3.7E-02	3.7E-02	3.7E-02			
0235 7677	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+02	1.8E+02	1.3E+02	9.2E+01	6.3E+01	2.5E+01
	2.3E+00	1.1E+00	2.4E-01	4.1E-01	1.9E-01	7.5E-02
	1.1E-01	3.7E-02	3.7E-02			
0236 7276	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+02	2.2E+02	1.7E+02	1.3E+02	8.9E+01	3.3E+01
	3.7E+00	9.2E-01	8.9E-01	3.7E-01	2.2E-01	1.9E-01
	3.7E-02	7.5E-02	1.5E-01			
0237 7947	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	2.0E+02	1.5E+02	1.2E+02	9.5E+01	3.9E+01
	3.[illegible]E+00	9.2E-01	1.0E+00	6.4E-01	1.5E-01	3.7E-02
	1.5E-01	0.0E-01	3.7E-02			

DAY 219 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DSP LINES 2,3&4 = ASSP

0238 5105	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	2.3E+02	2.1E+02	1.9E+02	1.6E+02	6.7E+01
	8.5E+00	2.1E+00	8.3E-01	6.9E-01	2.6E-01	2.9E-01
	1.8E-01	7.3E-02	7.3E-02			
0239 5006	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	2.4E+02	2.4E+02	2.4E+02	2.1E+02	1.1E+02
	1.5E+01	2.8E+00	2.0E+00	9.1E-01	3.6E-01	1.5E-01
	1.8E-01	1.5E-01	7.3E-02			
0240 5328	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+02	2.5E+02	2.6E+02	2.3E+02	2.0E+02	9.4E+01
	1.2E+01	3.1E+00	1.7E+00	7.3E-01	3.6E-01	1.8E-01
	2.2E-01	1.5E-01	1.1E-01			
0241 5677	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+01	2.2E+02	2.1E+02	1.8E+02	1.5E+02	6.6E+01
	7.4E+00	2.0E+00	9.8E-01	4.4E-01	3.6E-01	1.1E-01
	3.6E-02	3.6E-02	2.2E-01			
0242 4899	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.0E+01	2.4E+02	2.5E+02	2.2E+02	1.9E+02	9.1E+01
	1.1E+01	2.7E+00	1.3E+00	6.9E-01	2.6E-01	3.3E-01
	1.1E-01	1.1E-01	1.1E-01			
0243 5321	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.6E+01	2.4E+02	2.6E+02	2.4E+02	2.2E+02	9.8E+01
	1.6E+01	3.7E+00	1.8E+00	9.1E-01	2.6E-01	2.9E-01
	2.6E-01	3.6E-02	2.2E-01			
0244 4110	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.0E+01	2.2E+02	2.5E+02	2.5E+02	2.1E+02	8.9E+01
	1.4E+01	3.4E+00	1.6E+00	1.5E+00	7.3E-01	3.6E-01
	2.2E-01	1.8E-01	2.2E-01			
0245 4774	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.9E+01	2.2E+02	2.6E+02	2.6E+02	2.3E+02	1.0E+02
	1.5E+01	3.5E+00	2.0E+00	1.2E+00	4.7E-01	1.5E-01
	2.2E-01	1.5E-01	1.1E-01			
0246 5098	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.6E+01	2.1E+02	2.4E+02	2.2E+02	1.9E+02	8.1E+01
	1.3E+01	3.2E+00	1.2E+00	9.1E-01	6.6E-01	2.2E-01
	2.2E-01	2.2E-01	7.3E-02			
0247 3947	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.6E+01	2.5E+02	2.7E+02	2.6E+02	2.3E+02	1.0E+02
	1.7E+01	4.9E+00	2.7E+00	1.5E+00	9.9E-01	2.6E-01
	4.7E-01	2.9E-01	2.9E-01			
0248 4295	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+02	2.6E+02	2.7E+02	2.5E+02	2.2E+02	1.0E+02
	1.4E+01	4.2E+00	2.5E+00	1.4E+00	4.7E-01	4.0E-01
	1.1E-01	1.5E-01	2.2E-01			
0249 5032	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	2.5E+02	2.3E+02	2.1E+02	1.7E+02	8.1E+01
	1.2E+01	2.7E+00	1.7E+00	9.9E-01	5.8E-01	1.5E-01
	3.6E-01	1.8E-01	1.1E-01			
0250 4893	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	2.4E+02	2.3E+02	2.1E+02	1.9E+02	1.1E+02
	1.6E+01	5.6E+00	2.8E+00	2.6E+00	1.2E+00	5.1E-01
	7.7E-01	8.8E-01	7.7E-01			

0259 1939	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	7.1E+01	3.9E+02	4.8E+02	4.3E+02	4.0E+02	2.2E+02
	7.2E+01	2.6E+01	1.5E+01	8.6E+00	3.1E+00	1.6E+00
	1.6E+00	1.8E+00	9.8E-01			
0300 2045	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	6.3E+01	4.1E+02	5.3E+02	5.0E+02	4.7E+02	2.7E+02
	1.0E+02	3.9E+01	2.2E+01	1.3E+01	5.6E+00	1.9E+00
	2.0E+00	1.4E+00	1.3E+00			
0301 2063	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	7.7E+01	4.3E+02	5.0E+02	4.6E+02	4.2E+02	2.3E+02
	8.2E+01	3.3E+01	1.5E+01	9.6E+00	4.0E+00	1.4E+00
	2.0E+00	1.3E+00	9.0E-01			
0314 336	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	6.3E+01	4.9E+02	8.3E+02	1.6E+02	1.9E+02	8.2E+02
	4.3E+02	2.4E+02	1.6E+02	9.6E+01	4.3E+01	3.6E+01
	3.0E+01	2.5E+01	2.1E+01			
0315 336	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	6.7E+01	5.0E+02	8.1E+02	1.1E+02	1.3E+02	7.5E+02
	3.4E+02	1.8E+02	1.2E+02	7.1E+01	3.3E+01	2.9E+01
	2.3E+01	1.8E+01	1.7E+01			
0316 316	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	6.9E+01	5.1E+02	8.0E+02	8.1E+01	1.3E+02	8.2E+02
	4.9E+02	2.7E+02	1.8E+02	1.1E+02	5.0E+01	3.9E+01
	3.0E+01	2.5E+01	2.0E+01			
0330 267	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	1.3E+02	7.5E+02	1.0E+03	9.8E+00	1.1E+03	8.5E+02
	4.9E+02	2.7E+02	1.8E+02	1.1E+02	5.7E+01	4.5E+01
	3.9E+01	3.1E+01	2.7E+01			
0331 244	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	1.5E+02	9.2E+02	5.4E+00	3.7E+01	1.1E+03	8.5E+02
	5.1E+02	2.9E+02	1.9E+02	1.1E+02	5.6E+01	3.7E+01
	3.7E+01	2.9E+01	2.5E+01			
0332 229	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	1.3E+02	8.8E+02	1.4E+01	1.4E+02	1.1E+02	9.1E+02
	5.6E+02	3.2E+02	2.0E+02	1.2E+02	6.7E+01	4.7E+01
	4.2E+01	3.2E+01	2.7E+01			
0343 219	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	8.5E+01	5.5E+02	7.8E+02	3.8E+01	9.6E+01	8.3E+02
	6.3E+02	3.7E+02	2.3E+02	1.3E+02	6.3E+01	2.6E+01
	2.1E+01	1.4E+01	1.2E+01			
0344 218	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADDP 4	9.1E+01	4.9E+02	7.1E+02	2.1E+01	9.0E+01	8.5E+02
	5.9E+02	3.5E+02	2.1E+02	1.3E+02	5.2E+01	2.6E+01
	1.9E+01	1.5E+01	1.2E+01			

0345 207	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.0E+01	2.0E+01	9.9E+01	2.7E+01	1.9E+01	1.0E+01
	9.7E+00	8.0E+00	6.1E+00	6.1E+00	4.7E+00	4.1E+00
	3.5E+00	3.2E+00	2.5E+00			
0346 215	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.4E+01	2.5E+01	1.1E+02	2.7E+01	1.5E+01	8.1E+00
	5.7E+00	5.0E+00	4.1E+00	3.8E+00	3.3E+00	3.5E+00
	3.1E+00	2.8E+00	2.6E+00			
0347 211	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.1E+01	1.5E+01	1.2E+02	2.5E+01	1.6E+01	7.9E+00
	5.8E+00	3.9E+00	4.1E+00	3.8E+00	3.4E+00	3.1E+00
	2.4E+00	2.1E+00	2.1E+00			
0348 217	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.5E+01	3.8E+01	1.6E+01	7.7E+00	5.1E+00	4.4E+00
	4.2E+00	4.1E+00	3.6E+00	3.5E+00	2.4E+00	1.8E+00
	1.3E+00	1.1E+00	4.3E-01			
0349 205	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.7E+01	3.7E+01	1.4E+01	7.5E+00	5.1E+00	4.3E+00
	3.5E+00	3.6E+00	2.6E+00	2.6E+00	2.1E+00	1.8E+00
	1.5E+00	9.3E-01	4.1E-01			
0350 206	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.3E+01	3.5E+01	1.3E+01	7.0E+00	5.2E+00	3.8E+00
	3.5E+00	3.5E+00	2.7E+00	2.5E+00	1.7E+00	1.6E+00
	1.3E+00	9.3E-01	5.4E-01			
0354 225	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	3.2E+01	2.7E+02	2.2E+02	1.6E+02	2.1E+02	1.1E+02
	3.3E+01	1.6E+01	1.0E+01	7.9E+00	5.8E+00	3.9E+00
	3.3E+00	2.8E+00	2.5E+00			
0355 224	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	2.8E+01	2.7E+02	2.4E+02	2.0E+02	2.1E+02	1.2E+02
	4.0E+01	1.5E+01	9.8E+00	8.3E+00	6.1E+00	3.4E+00
	3.6E+00	2.9E+00	2.8E+00			
0356 223	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	3.0E+01	2.5E+02	1.8E+02	1.5E+02	2.1E+02	1.1E+02
	3.3E+01	1.3E+01	8.4E+00	6.7E+00	5.2E+00	3.9E+00
	3.1E+00	2.8E+00	2.7E+00			
0357 241	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.6E+01	2.2E+01	7.2E+01	2.0E+01	1.4E+01	7.9E+00
	5.2E+00	3.8E+00	2.8E+00	2.0E+00	1.9E+00	1.6E+00
	1.4E+00	1.2E+00	9.2E-01			
0358 247	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E 01	0.0E-01
ASSP 3	4.2E+01	5.7E+01	7.3E+01	1.1E+01	7.9E+00	4.2E+00
	3.8E+00	3.5E+00	2.7E+00	2.3E+00	2.1E+00	1.6E+00
	1.3E+00	1.2E+00	9.3E-01			
0359 252	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.3E+01	5.3E+01	6.3E+01	1.1E+01	6.9E+00	4.4E+00
	3.6E+00	3.3E+00	2.8E+00	2.4E+00	1.8E+00	1.4E+00
	1.5E+00	1.2E+00	8.6E-01			
0400 259	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.2E+01	7.7E+01	6.2E+01	1.1E+01	7.0E+00	4.6E+00
	4.2E+00	3.9E+00	3.2E+00	3.1E+00	2.5E+00	2.1E+00
	1.6E+00	1.3E+00	9.8E-01			

0401 272	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.4E+01	2.9E+01	1.0E+01	4.0E+00	3.7E+00	3.7E+00
	2.7E+00	2.5E+00	1.7E+00	1.3E+00	9.7E-01	6.2E-01
	[illegible]	1.7E-01	9.5E-02			
0402 2[illegible]4	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.4E+01	2.8E+01	9.5E+00	6.2E+00	5.9E+00	5.0E+00
	7.0E+00	3.2E+00	2.7E+00	1.4E+00	1.0E+00	7.0E-01
	4.6E-01	3.2E-01	9.5E-02			
0403 259	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.4E+01	2.6E+01	9.3E+00	6.1E+00	5.8E+00	5.2E+00
	4.1E+00	3.3E+00	2.3E+00	1.6E+00	9.5E-01	5.6E-01
	3.3E-01	1.6E-01	7.6E-02			
0415 245	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.8E+01	1.4E+01	9.9E+00	9.5E+00	1.1E+01	1.2E+01
	1.0E+01	7.9E+00	4.5E+00	1.9E+00	5.7E-01	2.6E-01
	3.9E-02	0.0E-01	9.5E-03			
0416 272	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.8E+01	1.2E+01	7.9E+00	7.6E+00	8.5E+00	9.4E+00
	7.4E+00	5.3E+00	2.8E+00	1.4E+00	5.3E-01	2.5E-01
	5.9E-02	3.9E-02	9.5E-03			
0417 298	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.4E+01	1.6E+01	9.8E+00	7.1E+00	6.9E+00	7.2E+00
	5.7E+00	4.4E+00	2.8E+00	1.3E+00	5.8E-01	2.7E-01
	8.9E-02	3.0E-02	9.5E-03			
0428 259	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.8E+01	1.3E+01	8.7E+00	5.8E+00	6.9E+00	7.2E+00
	5.5E+00	4.7E+00	3.2E+00	1.5E+00	7.3E-01	3.0E-01
	3.9E-02	3.0E-02	0.0E-01			
0429 248	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+01	1.8E+01	9.5E+00	7.4E+00	6.8E+00	6.4E+00
	5.1E+00	4.3E+00	3.3E+00	1.7E+00	9.3E-01	3.7E-01
	1.2E-01	3.9E-02	1.9E-02			
0430 245	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.1E+01	1.6E+01	9.6E+00	7.0E+00	7.0E+00	6.0E+00
	4.7E+00	4.2E+00	2.6E+00	1.8E+00	9.4E-01	4.2E-01
	2.2E-01	4.9E-02	9.5E-03			
0450 978	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.6E+01	6.4E+01	7.9E+00	4.0E+00	2.6E+00	2.1E+00
	2.1E+00	2.2E+00	1.7E+00	1.8E+00	2.1E+00	1.3E+00
	1.4E+00	1.0E+00	7.0E-01			
0451 797	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.3E+01	8.8E+01	1.3E+01	5.7E+00	2.8E+00	1.7E+00
	1.5E+00	1.5E+00	1.4E+00	1.2E+00	1.1E+00	1.1E+00
	8.6E-01	7.4E-01	5.4E-01			
0452 780	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.9E+01	8.3E+01	1.3E+01	5.6E+00	3.1E+00	2.3E+00
	1.7E+00	1.8E+00	1.7E+00	1.5E+00	1.5E+00	1.3E+00
	1.0E+00	6.2E-01	6.4E-01			

0500 550	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.4E+01	1.2E+02	2.6E+01	1.3E+01	5.2E+00	3.4E+00
	3.1E+00	2.9E+00	2.6E+00	2.1E+00	2.2E+00	2.0E+00
	1.7E+00	1.6E+00	1.0E+00			
0501 566	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	1.1E+02	2.1E+01	1.2E+01	5.6E+00	3.5E+00
	3.3E+00	3.1E+00	2.3E+00	2.8E+00	2.2E+00	1.9E+00
	1.7E+00	1.7E+00	1.3E+00			
0502 665	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	9.9E+01	2.1E+01	1.1E+01	4.4E+00	2.9E+00
	2.4E+00	1.9E+00	1.7E+00	1.7E+00	1.6E+00	1.4E+00
	1.3E+00	1.0E+00	9.4E-01			
0511 578	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	9.1E+01	2.5E+01	1.5E+01	7.3E+00	6.0E+00
	5.3E+00	4.7E+00	3.8E+00	2.9E+00	2.5E+00	1.5E+00
	1.2E+00	5.3E-01	2.3E-01			
0512 564	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E+01	8.3E+01	2.1E+01	1.1E+01	6.3E+00	4.9E+00
	4.4E+00	4.0E+00	3.7E+00	2.8E+00	2.3E+00	1.4E+00
	1.0E+00	8.9E-01	6.0E-01			
0513 591	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	8.9E+01	1.8E+01	9.2E+00	5.7E+00	4.0E+00
	3.6E+00	3.4E+00	3.2E+00	2.4E+00	2.1E+00	1.4E+00
	1.0E+00	1.0E+00	4.2E-01			
0514 615	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	8.3E+00	7.8E+00	5.3E+00	3.4E+00	3.2E+00	3.0E+00
	2.3E+00	1.7E+00	1.2E+00	8.2E-01	5.2E-01	2.9E-01
	2.1E-01	4.6E-02	6.6E-02			
0515 555	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E+01	8.1E+00	4.8E+00	2.8E+00	2.9E+00	2.6E+00
	1.9E+00	1.6E+00	1.1E+00	6.8E-01	3.8E-01	1.9E-01
	1.4E-01	5.3E-02	0.0E-01			
0516 639	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.5E+01	6.8E+00	3.5E+00	2.1E+00	1.9E+00	2.1E+00
	1.7E+00	1.3E+00	7.8E-01	4.6E-01	2.3E-01	1.6E-01
	1.1E-01	3.1E-02	1.5E-02			
0517 681	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.4E+01	1.1E+01	5.0E+00	2.6E+00	2.3E+00	2.1E+00
	1.5E+00	1.3E+00	1.0E+00	6.9E-01	4.3E-01	2.1E-01
	8.4E-02	4.6E-02	0.0E-01			
0518 680	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.6E+01	9.4E+00	4.6E+00	2.6E+00	2.1E+00	2.1E+00
	1.4E+00	1.3E+00	7.2E-01	5.0E-01	3.3E-01	1.4E-01
	5.3E-02	1.5E-02	7.4E-03			
0519 612	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E+01	9.9E+00	5.1E+00	2.2E+00	1.9E+00	2.0E+00
	1.7E+00	1.3E+00	9.0E-01	6.7E-01	5.5E-01	3.1E-01
	1.4E-01	6.1E-02	2.2E-02			

0520 642	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.6E+01	2.3E+02	3.3E+02	4.2E+02	4.4E+02	2.8E+02
	2.0E+02	1.0E+02	4.8E+01	1.3E+01	9.5E+00	7.9E+00
	5.7E+00	3.8E+00	2.4E+00			
0521 653	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.2E+02	2.8E+02	3.2E+02	3.5E+02	3.7E+02	2.3E+02
	1.7E+02	9.1E+01	4.7E+01	1.3E+01	8.2E+00	5.7E+00
	5.4E+00	3.6E+00	2.4E+00			
0522 627	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+01	2.5E+02	3.1E+02	3.7E+02	3.9E+02	2.6E+02
	1.3E+02	1.0E+02	4.7E+01	1.4E+01	1.1E+01	7.1E+00
	6.6E+00	5.1E+00	2.9E+00			
0523 614	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E+01	2.7E+02	3.1E+02	3.5E+02	3.8E+02	2.5E+02
	1.8E+02	9.8E+01	4.8E+01	1.3E+01	7.8E+00	6.5E+00
	6.1E+00	4.3E+00	2.7E+00			
0524 591	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.0E+01	1.0E+02	1.7E+01	9.6E+00	4.9E+00	3.2E+00
	2.5E+00	2.3E+00	1.7E+00	9.5E-01	6.4E-01	8.7E-01
	5.6E-01	4.9E-01	2.9E-01			
0525 659	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.0E+01	9.5E+01	1.2E+01	6.3E+00	3.9E+00	3.2E+00
	2.4E+00	2.2E+00	1.6E+00	1.1E+00	7.4E-01	5.6E-01
	4.3E-01	2.5E-01	2.4E-01			
0526 639	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.2E+01	1.0E+02	1.3E+01	5.8E+00	3.4E+00	2.8E+00
	2.2E+00	1.7E+00	1.3E+00	8.9E-01	7.2E-01	4.7E-01
	4.2E-01	2.3E-01	1.9E-01			
0527 615	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	9.9E+01	1.5E+01	8.4E+00	4.3E+00	3.4E+00
	2.9E+00	2.7E+00	1.7E+00	1.1E+00	8.4E-01	6.5E-01
	6.2E-01	4.2E-01	2.7E-01			
0528 661	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	9.4E+01	1.5E+01	8.5E+00	4.4E+00	3.6E+00
	2.9E+00	2.4E+00	1.8E+00	8.7E-01	9.3E-01	6.6E-01
	5.3E-01	5.1E-01	3.2E-01			
0529 575	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E+01	8.8E+01	1.8E+01	1.0E+01	4.3E+00	3.6E+00
	3.0E+00	2.7E+00	2.1E+00	1.6E+00	1.6E+00	1.0E+00
	6.6E-01	5.1E-01	3.2E-01			
0530 572	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	9.9E+01	2.0E+01	1.0E+01	5.7E+00	3.8E+00
	3.4E+00	2.9E+00	2.4E+00	1.8E+00	1.4E+00	9.8E-01
	7.9E-01	7.0E-01	3.8E-01			
0531 597	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	1.0E+02	1.9E+01	9.4E+00	5.8E+00	4.4E+00
	3.7E+00	3.0E+00	2.4E+00	1.4E+00	1.3E+00	8.5E-01
	5.3E-01	4.0E-01	2.7E-01			

0549 701	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	8.0E+01	2.9E+01	2.0E+01	9.1E+00	4.2E+00
	2.2E+00	1.1E+00	7.1E-01	6.9E-01	5.4E-01	5.1E-01
	2.6E-01	2.4E-01	2.5E-01			
0550 621	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.6E+01	6.9E+01	3.2E+01	2.5E+01	1.4E+01	7.7E+00
	4.0E+00	2.2E+00	1.1E+00	7.2E-01	7.2E-01	4.9E-01
	5.3E-01	5.3E-01	3.8E-01			
0551 568	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+01	7.2E+01	3.3E+01	2.6E+01	1.5E+01	9.9E+00
	4.6E+00	2.7E+00	1.2E+00	8.0E-01	7.3E-01	7.4E-01
	4.9E-01	3.0E-01	4.2E-01			
0552 501	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.2E+00	1.8E+01	1.9E+01	1.4E+01	6.3E+00	2.9E+00
	1.1E+00	9.9E-01	7.5E-01	4.5E-01	3.5E-01	2.3E-01
	6.0E-02	6.0E-02	2.9E-02			
0553 455	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.0E+00	1.2E+01	1.6E+01	1.6E+01	9.0E+00	4.4E+00
	1.9E+00	1.4E+00	1.1E+00	7.7E-01	4.7E-01	3.5E-01
	1.3E-01	1.4E-01	3.6E-02			
0554 420	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.6E+00	1.2E+01	1.5E+01	1.6E+01	1.0E+01	5.3E+00
	2.6E+00	1.5E+00	1.1E+00	9.0E-01	5.4E-01	4.0E-01
	2.5E-01	1.4E-01	2.9E-02			
0602 282	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	4.4E+00	1.2E+01	1.9E+01	2.0E+01	1.6E+01
	1.0E+01	6.3E+00	2.8E+00	1.3E+00	5.9E-01	2.9E-01
	1.6E-01	1.3E-01	8.7E-02			
0603 275	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.3E+00	4.4E+00	1.2E+01	1.8E+01	1.8E+01	1.5E+01
	9.2E+00	6.3E+00	3.0E+00	1.3E+00	6.3E-01	2.6E-01
	2.0E-01	8.3E-02	6.6E-02			
0604 279	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	4.3E+00	1.1E+01	1.6E+01	1.8E+01	1.5E+01
	1.0E+01	6.0E+00	2.7E+00	1.2E+00	6.1E-01	2.2E-01
	1.2E-01	7.5E-02	2.9E-02			
0605 295	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	6.2E+00	5.0E+01	1.7E+01	2.0E+01	2.6E+01	2.4E+01
	2.2E+01	2.0E+01	1.7E+01	1.2E+01	9.4E+00	6.2E+00
	3.9E+00	2.7E+00	1.5E+00			
0606 283	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.9E+00	6.1E+01	2.2E+01	2.4E+01	2.7E+01	2.3E+01
	2.1E+01	1.7E+01	1.4E+01	1.1E+01	8.2E+00	6.2E+00
	4.4E+00	3.0E+00	2.0E+00			
0607 292	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.3E+01	8.6E+01	1.9E+01	1.9E+01	1.8E+01	1.8E+01
	1.8E+01	1.6E+01	1.2E+01	1.0E+01	7.5E+00	5.6E+00
	3.3E+00	2.7E+00	1.5E+00			
0608 286	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.2E+00	4.2E+01	1.1E+01	1.5E+01	1.8E+01	2.1E+01
	2.0E+01	1.7E+01	1.6E+01	1.2E+01	9.4E+00	7.3E+00
	5.3E+00	2.9E+00	2.0E+00			

0609	268	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	4	1.2E+02	3.1E+02	3.5E+02	4.0E+02	3.8E+02	2.4E+02
		1.6E+02	8.3E+01	4.5E+01	2.6E+01	2.1E+01	1.9E+01
		1.8E+01	1.7E+01	1.6E+01			
0610	305	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	4	7.6E+01	2.6E+02	3.5E+02	4.3E+02	4.2E+02	2.6E+02
		1.9E+02	9.3E+01	4.6E+01	2.6E+01	2.3E+01	2.0E+01
		1.8E+01	1.6E+01	1.5E+01			
0611	300	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	4	6.9E+01	2.7E+02	3.4E+02	4.0E+02	4.1E+02	2.9E+02
		2.1E+02	1.0E+02	4.9E+01	2.2E+01	1.9E+01	1.5E+01
		1.4E+01	1.3E+01	1.2E+01			
0612	351	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	2	1.7E+01	1.7E+02	2.6E+02	2.2E+02	9.8E+01	3.7E+01
		2.3E+01	2.2E+01	1.8E+01	1.6E+01	1.7E+01	1.4E+01
		1.4E+01	1.2E+01	1.2E+01			
0613	351	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	2	1.9E+01	1.7E+02	2.4E+02	1.7E+02	7.7E+01	3.1E+01
		1.9E+01	2.1E+01	1.9E+01	2.0E+01	1.9E+01	1.5E+01
		1.6E+01	1.6E+01	1.4E+01			
0614	339	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	2	1.9E+01	2.1E+02	2.9E+02	2.0E+02	8.8E+01	3.7E+01
		2.3E+01	2.1E+01	1.9E+01	1.9E+01	1.8E+01	1.7E+01
		1.5E+01	1.4E+01	1.4E+01			
0615	294	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	1	3.0E+00	7.4E+00	1.1E+01	1.5E+01	1.6E+01	1.4E+01
		1.1E+01	8.1E+00	5.1E+00	3.0E+00	2.0E+00	1.2E+00
		5.8E-01	4.1E-01	2.0E-01			
0616	268	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	1	2.2E+00	5.7E+00	9.3E+00	1.4E+01	1.7E+01	1.6E+01
		1.2E+01	9.1E+00	6.2E+00	3.8E+00	2.7E+00	1.2E+00
		7.4E-01	2.5E-01	1.6E-01			
0617	271	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	1	1.5E+00	5.0E+00	6.8E+00	1.2E+01	1.5E+01	1.5E+01
		1.3E+01	9.5E+00	6.4E+00	4.3E+00	2.6E+00	1.4E+00
		1.1E+00	3.1E-01	2.8E-01			
0621	195	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	4	3.8E+01	3.0E+02	4.6E+02	5.3E+02	5.3E+02	3.2E+02
		2.1E+02	1.2E+02	6.5E+01	3.5E+01	3.1E+01	2.7E+01
		2.5E+01	2.5E+01	2.3E+01			
0622	240	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	4	3.4E+01	2.8E+02	4.3E+02	.5.0E+02	4.7E+02	2.8E+02
		2.1E+02	1.1E+02	5.8E+01	3.4E+01	3.0E+01	2.8E+01
		2.6E+01	2.6E+01	2.6E+01			
0620	174	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP	3	7.3E+00	5.9E+01	1.1E+01	1.3E+01	1.8E+01	2.0E+01
		2.1E+01	1.8E+01	1.8E+01	1.5E+01	1.3E+01	1.0E+01
		8.0E+00	6.0E+00	4.7E+00			

0623	228	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2		1.4E+01	2.1E+02	3.6E+02	2.6E+02	1.2E+02	4.4E+01
		3.1E+01	2.9E+01	2.5E+01	2.4E+01	2.5E+01	2.1E+01
		2.1E+01	1.9E+01	2.1E+01			
0624	301	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2		1.4E+01	2.1E+02	3.5E+02	2.4E+02	1.1E+02	4.5E+01
		3.1E+01	3.0E+01	2.7E+01	2.7E+01	2.9E+01	2.4E+01
		2.3E+01	2.1E+01	2.3E+01			
0625	214	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		2.1E+00	6.4E+00	1.4E+01	1.8E+01	1.8E+01	1.6E+01
		1.3E+01	9.6E+00	6.7E+00	4.2E+00	2.2E+00	1.1E+00
		6.8E-01	3.5E-01	3.1E-01			
0626	196	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		1.5E+00	4.4E+00	1.1E+01	1.8E+01	2.0E+01	1.8E+01
		1.3E+01	9.6E+00	5.6E+00	3.4E+00	2.0E+00	9.1E-01
		3.2E-01	1.1E-01	6.2E-02			
0627	211	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		3.9E+00	6.1E+00	1.3E+01	2.0E+01	2.1E+01	2.0E+01
		1.3E+01	9.4E+00	5.6E+00	3.2E+00	1.9E+00	1.2E+00
		6.9E-01	3.0E-01	2.1E-01			
0628	218	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		1.4E+01	9.2E+01	2.1E+01	2.6E+01	3.1E+01	2.9E+01
		2.7E+01	2.3E+01	2.0E+01	1.4E+01	1.1E+01	7.4E+00
		5.6E+00	3.5E+00	3.2E+00			
0629	202	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		1.1E+01	8.2E+01	1.9E+01	2.4E+01	2.8E+01	2.8E+01
		2.6E+01	2.3E+01	1.9E+01	1.4E+01	1.1E+01	6.9E+00
		4.8E+00	3.8E+00	2.0E+00			
0630	210	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		7.2E+00	6.1E+01	2.0E+01	2.5E+01	2.9E+01	2.7E+01
		2.7E+01	2.4E+01	2.0E+01	1.6E+01	1.1E+01	7.1E+00
		5.3E+00	3.4E+00	2.4E+00			
0631	197	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		6.7E+00	6.5E+01	2.0E+01	2.5E+01	3.2E+01	3.0E+01
		2.7E+01	2.4E+01	2.0E+01	1.5E+01	1.2E+01	8.0E+00
		5.2E+00	4.0E+00	2.6E+00			

[illegible] 223	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.3E+00	6.4E+01	1.9E+01	2.5E+01	3.3E+01	3.1E+01
	2.8E+01	2.5E+01	2.0E+01	1.6E+01	1.1E+01	8.4E+00
	5.5E+00	4.0E+00	2.3E+00			
0633 212	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	6.5E+00	6.3E+01	2.1E+01	2.7E+01	3.6E+01	3.5E+01
	3.2E+01	2.8E+01	2.4E+01	1.8E+01	1.3E+01	9.1E+00
	6.3E+00	4.3E+00	2.9E+00			
0634 173	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.2E+00	8.5E+01	2.2E+01	2.3E+01	3.0E+01	2.8E+01
	2.5E+01	2.2E+01	1.8E+01	1.5E+01	1.1E+01	7.6E+00
	5.6E+00	3.6E+00	3.0E+00			

0635 167	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.0E+01	3.6E+02	4.7E+02	5.6E+02	5.6E+02	3.9E+02
	2.6E+02	1.4E+02	9.1E+01	4.6E+01	3.8E+01	3.6E+01
	3.7E+01	3.5E+01	3.0E+01			
0636 180	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.8E+01	2.7E+02	4.0E+02	5.5E+02	5.2E+02	3.4E+02
	2.3E+02	1.3E+02	8.3E+01	6.0E+01	5.0E+01	4.9E+01
	4.5E+01	4.5E+01	4.3E+01			
0637 229	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.4E+01	2.9E+02	4.1E+02	5.6E+02	5.4E+02	3.6E+02
	2.5E+02	1.3E+02	8.5E+01	5.1E+01	4.3E+01	4.2E+01
	3.9E+01	3.7E+01	3.7E+01			

0638 181	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.4E+00	7.6E+01	2.5E+01	2.8E+01	3.6E+01	3.3E+01
	3.1E+01	2.8E+01	2.4E+01	1.8E+01	1.3E+01	1.0E+01
	7.0E+00	5.0E+00	3.4E+00			
0639 203	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.4E+00	4.7E+01	1.8E+01	2.3E+01	2.9E+01	2.9E+01
	2.8E+01	2.7E+01	2.3E+01	1.9E+01	1.5E+01	1.0E+01
	7.0E+00	4.9E+00	3.3E+00			

0640 220	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.4E+01	1.9E+02	3.5E+02	2.6E+02	1.3E+02	5.8E+01
	3.4E+01	3.4E+01	3.0E+01	3.2E+01	3.0E+01	2.7E+01
	2.5E+01	2.4E+01	2.2E+01			
0641 230	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.6E+01	1.7E+02	3.0E+02	2.4E+02	1.2E+02	5.5E+01
	3.4E+01	3.3E+01	2.9E+01	3.4E+01	3.2E+01	2.6E+01
	2.6E+01	2.4E+01	2.2E+01			

0642 207	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.2E+00	5.1E+00	1.1E+01	2.1E+01	2.2E+01	2.2E+01
	1.6E+01	1.0E+01	6.3E+00	4.3E+00	2.3E+00	1.3E+00
	1.0E+00	6.0E-01	3.6E-01			
0643 191	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.6E+00	5.2E+00	1.1E+01	1.9E+01	2.2E+01	2.1E+01
	1.5E+01	1.1E+01	6.0E+00	2.9E+00	1.8E+00	8.2E-01
	3.0E-01	2.3E-01	9.2E-02			
0644 217	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.6E+00	3.2E+00	8.7E+00	1.8E+01	2.5E+01	2.4E+01
	1.7E+01	1.2E+01	6.5E+00	3.4E+00	2.2E+00	1.2E+00
	5.4E-01	3.6E-01	1.5E-01			
0645 203	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.1E+01	1.2E+02	2.3E+02	1.9E+02	9.4E+01	4.5E+01
	3.2E+01	3.2E+01	3.1E+01	3.1E+01	3.5E+01	3.0E+01
	2.9E+01	2.6E+01	2.6E+01			
0646 209	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.0E+01	1.8E+02	3.5E+02	2.8E+02	1.4E+02	7.5E+01
	4.0E+01	3.7E+01	3.4E+01	3.6E+01	3.4E+01	2.9E+01
	2.6E+01	2.5E+01	2.4E+01			
0647 213	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.2E+01	1.9E+02	3.2E+02	2.4E+02	1.2E+02	6.9E+01
	3.5E+01	3.4E+01	3.2E+01	3.3E+01	3.1E+01	2.5E+01
	2.5E+01	2.3E+01	2.1E+01			
0648 199	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.4E+01	1.7E+02	3.2E+02	2.4E+02	1.2E+02	6.7E+01
	3.3E+01	3.1E+01	2.8E+01	3.2E+01	2.8E+01	2.6E+01
	2.5E+01	2.3E+01	2.2E+01			
0649 215	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.0E+00	5.5E+01	2.3E+01	2.3E+01	3.1E+01	3.1E+01
	3.0E+01	2.7E+01	2.3E+01	2.0E+01	1.5E+01	9.6E+00
	7.2E+00	4.5E+00	3.0E+00			
0650 192	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.0E+00	6.6E+01	1.7E+01	2.0E+01	2.5E+01	2.9E+01
	2.9E+01	2.8E+01	2.2E+01	1.7E+01	1.3E+01	9.0E+00
	6.1E+00	3.7E+00	2.7E+00			
0651 217	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.9E+00	6.0E+01	1.8E+01	2.2E+01	3.1E+01	3.1E+01
	3.1E+01	2.8E+01	2.4E+01	1.9E+01	1.4E+01	9.4E+00
	6.3E+00	4.1E+00	2.3E+00			
0652 226	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.7E+00	8.3E+01	2.3E+01	2.4E+01	3.3E+01	3.3E+01
	3.2E+01	2.9E+01	2.5E+01	1.9E+01	1.3E+01	9.6E+00
	6.2E+00	4.5E+00	2.6E+00			

0653 199	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	[illegible]	2.7E+02	[illegible]	4.3E+02	4.7E+02	3.2E+02
	[illegible]	[illegible]	7.5E+01	4.2E+01	3.2E+01	2.8E+01
	2.7E+01	2.7E+01	2.3E+01			
0654 193	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	[illegible]	[illegible]	4.7E+02	5.5E+02	5.8E+02	4.1E+02
	2.9E+02	1.6E+02	9.5E+01	4.4E+01	3.0E+01	2.9E+01
	2.7E+01	2.5E+01	2.3E+01			
0655 221	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+01	2.9E+02	3.8E+02	4.5E+02	4.4E+02	3.0E+02
	2.6E+02	1.1E+02	6.8E+01	3.8E+01	3.1E+01	3.0E+01
	3.0E+01	2.7E+01	2.8E+01			
0656 202	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.0E+00	8.9E+00	1.6E+01	2.1E+01	2.3E+01	2.0E+01
	1.5E+01	1.1E+01	6.2E+00	3.9E+00	2.1E+00	1.2E+00
	6.9E-01	4.0E-01	3.5E-01			
0657 231	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.2E+00	9.3E+00	1.8E+01	2.0E+01	2.3E+01	2.0E+01
	1.5E+01	1.1E+01	6.7E+00	3.9E+00	2.3E+00	1.3E+00
	6.7E-01	4.2E-01	2.5E-01			
0658 224	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.3E+00	7.4E+00	1.5E+01	2.0E+01	2.0E+01	1.9E+01
	1.4E+01	1.0E+01	6.5E+00	3.5E+00	2.1E+00	9.8E-01
	5.4E-01	3.1E-01	1.3E-01			
0659 227	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.7E+00	8.1E+01	2.9E+01	3.1E+01	3.9E+01	3.4E+01
	3.4E+01	2.8E+01	2.2E+01	1.7E+01	1.3E+01	9.1E+00
	6.6E+00	5.5E+00	3.1E+00			
0700 231	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.5E+00	4.6E+01	2.9E+01	4.0E+01	5.0E+01	4.3E+01
	3.6E+01	2.9E+01	2.0E+01	1.6E+01	1.2E+01	7.5E+00
	5.3E+00	3.6E+00	2.4E+00			
0701 236	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.8E+00	1.0E+02	4.7E+01	5.3E+01	5.4E+01	4.6E+01
	4.0E+01	2.9E+01	2.2E+01	1.5E+01	1.0E+01	8.0E+00
	4.9E+00	3.4E+00	2.5E+00			
0709 338	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.3E+01	7.1E+01	3.1E+01	2.9E+01	2.5E+01	1.7E+01
	1.5E+01	1.2E+01	9.4E+00	7.1E+00	5.3E+00	3.5E+00
	2.4E+00	1.4E+00	9.6E-01			
0710 369	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E+01	1.1E+02	3.7E+01	2.9E+01	2.4E+01	1.8E+01
	1.6E+01	1.2E+01	1.0E+01	6.6E+00	5.4E+00	3.5E+00
	2.0E+00	1.7E+00	9.4E-01			
0711 701	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.4E+01	8.5E+01	2.2E+01	2.0E+01	1.6E+01	1.3E+01
	1.1E+01	8.8E+00	7.2E+00	4.7E+00	3.6E+00	2.2E+00
	1.8E+00	1.2E+00	6.9E-01			

0713 1643	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.1E+02	3.1E+02	3.2E+02	3.0E+02	2.0E+02	5.5E+01
	2.2E+01	9.6E+00	4.2E+00	1.2E+00	6.0E-01	4.7E-01
	4.3E-01	2.1E-01	3.4E-01			
0714 1729	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.4E+01	3.5E+02	4.0E+02	3.7E+02	2.7E+02	8.5E+01
	4.0E+01	2.1E+01	1.0E+01	3.2E+00	3.0E+00	2.5E+00
	2.2E+00	1.8E+00	2.2E+00			
0715 2779	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.2E+01	3.1E+02	3.8E+02	3.5E+02	2.6E+02	9.1E+01
	4.0E+01	1.7E+01	9.3E+00	3.6E+00	3.5E+00	2.2E+00
	2.5E+00	2.7E+00	1.7E+00			
0717 3892	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.5E-01	9.9E-02	3.5E-02	1.7E-02	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01	8.7E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0718 4333	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.6E-01	1.7E-01	8.7E-03	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0719 4968	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.5E+01	1.1E+02	9.8E+01	1.5E+01	2.8E+00	9.2E-01
	6.4E-02	4.3E-02	0.0E-01	2.2E-02	0.0E-01	2.1E-02
	0.0E-01	0.0E-01	0.0E-01			
0720 5065	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.3E+01	1.1E+02	9.7E+01	1.6E+01	2.8E+00	1.2E+00
	4.3E-02	4.3E-02	4.3E-02	4.5E-02	2.3E-02	0.0E-01
	2.1E-02	0.0E-01	0.0E-01			

Fog 10A. August 7 (Day 219) 1975

DAY 219 NUMBER DENSITY (NO./CC/MICRON)
HOUR VSBY 1ST LINE = DAP LINES 2,3,4 = ASSP

1730 7558	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.5E+01	1.2E+02	1.3E+02	1.2E+02	1.2E+02	6.6E+01
	9.7E+00	3.6E+00	2.3E+00	1.5E+00	6.7E-01	2.5E-01
	1.4E-01	3.2E-01	2.1E-01			
1731 3827	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.5E+01	1.3E+02	1.7E+02	1.7E+02	1.7E+02	1.1E+02
	2.7E+01	8.7E+00	5.4E+00	3.3E+00	1.3E+00	6.0E-01
	6.3E-01	3.9E-01	4.9E-01			
1732 2989	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	1.2E+02	2.0E+02	2.2E+02	2.4E+02	1.7E+02
	5.9E+01	2.2E+01	1.5E+01	1.0E+01	3.8E+00	1.7E+00
	1.5E+00	1.8E+00	1.4E+00			
1733 2680	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	1.3E+02	2.1E+02	2.4E+02	2.5E+02	1.7E+02
	5.9E+01	2.4E+01	1.6E+01	9.7E+00	3.9E+00	2.3E+00
	1.8E+00	1.8E+00	1.4E+00			
1734 1402	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	1.2E+02	2.2E+02	2.6E+02	2.9E+02	2.2E+02
	1.1E+02	5.6E+01	3.7E+01	2.2E+01	8.2E+00	4.3E+00
	3.6E+00	3.3E+00	2.6E+00			
1735 1677	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+01	1.6E+02	3.2E+02	3.2E+02	3.7E+02	2.6E+02
	1.6E+02	8.9E+01	5.7E+01	2.8E+01	1.0E+01	6.7E+00
	5.5E+00	4.4E+00	3.2E+00			
1736 1812	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+01	1.5E+02	2.5E+02	3.0E+02	3.4E+02	2.4E+02
	1.3E+02	6.3E+01	3.6E+01	2.0E+01	1.0E+01	4.6E+00
	3.6E+00	2.7E+00	2.4E+00			
1737 2605	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.0E+01	1.9E+02	3.0E+02	3.2E+02	3.3E+02	2.2E+02
	9.9E+01	5.0E+01	2.9E+01	1.7E+01	5.2E+00	2.9E+00
	2.3E+00	1.9E+00	1.9E+00			
1738 2038	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.4E+01	2.2E+02	2.9E+02	2.9E+02	3.0E+02	1.8E+02
	6.0E+01	3.1E+01	1.6E+01	9.2E+00	4.1E+00	3.3E+00
	2.7E+00	3.1E+00	2.6E+00			
1739 1333	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.7E+01	2.0E+02	2.9E+02	2.9E+02	3.2E+02	2.1E+02
	1.1E+02	5.6E+01	3.0E+01	1.8E+01	5.7E+00	4.3E+00
	3.2E+00	2.7E+00	2.5E+00			
1740 1465	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+01	1.7E+02	2.6E+02	2.6E+02	3.0E+02	2.4E+02
	1.7E+02	9.4E+01	5.3E+01	2.9E+01	8.6E+00	5.2E+00
	3.8E+00	4.1E+00	3.5E+00			
1741 1296	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.2E+01	1.6E+02	2.5E+02	2.7E+02	3.1E+02	2.6E+02
	1.8E+02	1.0E+02	5.6E+01	2.9E+01	1.2E+01	6.9E+00
	6.5E+00	4.8E+00	3.9E+00			
1742 1720	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.6E+01	1.5E+02	2.8E+02	3.0E+02	3.5E+02	2.5E+02
	1.5E+02	7.7E+01	4.7E+01	2.4E+01	8.7E+00	4.6E+00
	3.6E+00	3.9E+00	2.8E+00			

1803 774	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.7E+01	2.0E+02	2.7E+02	2.8E+02	3.3E+02	2.6E+02
	2.0E+02	1.0E+02	5.9E+01	2.9E+01	1.5E+01	1.2E+01
	9.7E+00	8.7E+00	7.8E+00			
1804 748	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.9E+01	1.4E+02	2.4E+02	2.8E+02	3.4E+02	2.9E+02
	2.3E+02	1.2E+02	7.2E+01	3.5E+01	1.9E+01	1.6E+01
	1.3E+01	1.2E+01	9.2E+00			
1805 598	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.2E+01	1.1E+02	2.2E+02	2.8E+02	3.2E+02	2.5E+02
	1.6E+02	8.9E+01	5.7E+01	3.2E+01	2.0E+01	1.6E+01
	1.5E+01	1.4E+01	1.2E+01			
1912 538	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.1E+00	6.4E+00	5.6E+00	4.6E+00	4.0E+00	3.0E+00
	1.7E+00	1.1E+00	4.4E-01	2.0E-01	9.5E-02	4.3E-02
	4.7E-02	2.8E-02	0.0E-01			
1913 553	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.2E+00	6.9E+00	5.5E+00	4.1E+00	3.8E+00	2.8E+00
	1.6E+00	9.2E-01	4.3E-01	2.2E-01	9.0E-02	4.3E-02
	9.5E-03	9.5E-03	0.0E-01			
1914 545	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.4E+00	7.0E+00	5.3E+00	4.0E+00	3.6E+00	2.3E+00
	1.5E+00	6.8E-01	3.7E-01	1.4E-01	6.2E-02	2.8E-02
	2.4E-02	1.4E-02	4.6E-03			
1915 452	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+01	3.6E+01	1.4E+01	9.3E+00	6.5E+00	4.8E+00
	4.6E+00	3.7E+00	2.5E+00	1.8E+00	1.3E+00	6.3E-01
	3.8E-01	2.3E-01	1.5E-01			
1916 437	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+01	4.0E+01	1.5E+01	9.9E+00	6.5E+00	4.7E+00
	4.0E+00	3.3E+00	2.4E+00	1.5E+00	1.1E+00	6.8E-01
	3.8E-01	1.4E-01	1.6E-01			
1917 527	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+01	3.9E+01	1.5E+01	9.2E+00	5.7E+00	4.4E+00
	3.7E+00	3.1E+00	2.4E+00	1.5E+00	8.2E-01	4.7E-01
	2.4E-01	1.8E-01	1.2E-01			
1918 495	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.6E+01	3.9E+01	1.2E+01	8.4E+00	5.0E+00	4.3E+00
	3.6E+00	3.0E+00	1.8E+00	1.4E+00	7.5E-01	3.7E-01
	1.6E-01	9.3E-02	5.4E-02			
1919 409	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.6E+01	3.5E+01	1.3E+01	8.6E+00	6.5E+00	5.1E+00
	4.1E+00	3.6E+00	2.5E+00	1.4E+00	8.7E-01	5.2E-01
	3.0E-01	1.6E-01	1.0E-01			
1920 437	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E+01	3.5E+01	1.4E+01	9.1E+00	6.3E+00	5.2E+00
	4.5E+00	3.5E+00	2.5E+00	1.4E+00	9.6E-01	5.0E-01
	3.0E-01	2.1E-01	1.6E-01			

1921 463	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	[illegible]	1.2E+02	1.5E+02	9.8E+01	4.2E+01	1.6E+01
	[illegible]	9.8E+00	6.1E+00	5.0E+00	4.8E+00	3.6E+00
	3.5E+00	3.1E+00	2.8E+00			
1922 507	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.1E+01	1.2E+02	1.6E+02	1.1E+02	4.3E+01	1.7E+01
	1.2E+01	9.7E+00	6.2E+00	4.6E+00	5.0E+00	4.0E+00
	3.5E+00	3.3E+00	3.1E+00			
1923 464	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.1E+01	1.3E+02	1.6E+02	9.9E+01	4.2E+01	1.8E+01
	1.3E+01	9.6E+00	6.2E+00	4.8E+00	5.3E+00	3.8E+00
	3.9E+00	2.9E+00	3.1E+00			
1927 550	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.4E+01	1.4E+02	1.6E+02	9.9E+01	3.8E+01	1.8E+01
	1.3E+01	8.7E+00	5.3E+00	3.7E+00	3.8E+00	2.6E+00
	2.0E+00	1.5E+00	1.8E+00			
1928 596	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.1E+01	1.4E+02	1.6E+02	1.1E+02	4.9E+01	1.8E+01
	1.3E+01	8.3E+00	5.7E+00	4.0E+00	3.8E+00	2.9E+00
	2.6E+00	2.1E+00	1.9E+00			
1929 557	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.2E+01	1.5E+02	1.6E+02	1.1E+02	4.3E+01	1.7E+01
	1.2E+01	9.1E+00	5.7E+00	4.9E+00	5.1E+00	3.2E+00
	3.2E+00	2.3E+00	2.4E+00			
1930 602	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.2E+01	1.6E+02	2.5E+02	2.6E+02	2.2E+02	1.3E+02
	8.8E+01	3.5E+01	1.6E+01	1.3E+01	9.7E+00	8.0E+00
	5.6E+00	4.0E+00	3.3E+00			
1931 645	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.9E+01	1.8E+02	2.6E+02	2.8E+02	2.2E+02	1.2E+02
	7.8E+01	3.2E+01	1.4E+01	1.2E+01	9.4E+00	7.8E+00
	5.8E+00	4.0E+00	3.2E+00			
1932 590	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.9E+01	1.7E+02	2.7E+02	2.7E+02	2.2E+02	1.2E+02
	7.7E+01	3.2E+01	1.5E+01	1.1E+01	9.5E+00	6.7E+00
	4.6E+00	3.7E+00	2.6E+00			
1933 574	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.8E+01	1.6E+02	2.6E+02	2.6E+02	2.1E+02	1.2E+02
	7.6E+01	3.0E+01	1.3E+01	1.1E+01	7.8E+00	5.3E+00
	4.3E+00	3.2E+00	2.6E+00			
1934 622	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.6E+01	1.9E+02	2.5E+02	2.5E+02	2.1E+02	1.2E+02
	8.3E+01	3.4E+01	1.4E+01	1.0E+01	9.1E+00	6.1E+00
	4.4E+00	2.8E+00	2.1E+00			

1935 586	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	4.2E+01	1.6E+01	9.3E+00	5.3E+00	4.0E+00
	2.8E+00	1.7E+00	1.2E+00	7.8E-01	3.5E-01	1.7E-01
	1.0E-01	6.4E-02	7.2E-02			
1936 529	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E+01	4.0E+01	1.2E+01	8.0E+00	3.9E+00	3.4E+00
	2.7E+00	1.8E+00	1.2E+00	7.4E-01	4.5E-01	1.5E-01
	1.2E-01	8.9E-02	6.4E-02			
1937 522	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E+01	4.2E+01	1.4E+01	8.5E+00	4.5E+00	3.6E+00
	2.6E+00	2.1E+00	1.4E+00	6.8E-01	5.0E-01	1.9E-01
	1.4E-01	8.9E-02	6.4E-02			
1938 549	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E+01	4.1E+01	1.2E+01	7.9E+00	4.1E+00	3.1E+00
	1.7E+00	1.4E+00	8.1E-01	4.3E-01	1.6E-01	8.1E-02
	7.2E-02	3.2E-02	1.6E-02			
1939 500	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E+01	3.6E+01	1.2E+01	6.5E+00	3.7E+00	2.7E+00
	2.0E+00	1.1E+00	7.4E-01	4.4E-01	2.7E-01	1.5E-01
	9.7E-02	4.8E-02	7.2E-02			
1940 551	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	3.5E+01	1.2E+01	5.9E+00	3.4E+00	2.2E+00
	1.8E+00	1.2E+00	6.3E-01	4.3E-01	1.5E-01	1.3E-01
	4.8E-02	7.2E-02	8.1E-03			
1941 490	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	3.4E+01	1.1E+01	4.8E+00	2.7E+00	1.5E+00
	7.1E-01	4.4E-01	2.5E-01	1.8E-01	9.7E-02	4.0E-02
	5.6E-02	1.6E-02	1.6E-02			
1954 599	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	5.0E+01	2.1E+01	9.8E+00	6.0E+00	5.2E+00
	4.5E+00	4.1E+00	3.6E+00	2.8E+00	2.5E+00	1.7E+00
	1.0E+00	7.6E-01	4.4E-01			
1955 623	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	5.3E+01	1.9E+01	9.6E+00	6.7E+00	5.6E+00
	5.5E+00	5.0E+00	4.0E+00	3.5E+00	2.9E+00	1.8E+00
	1.4E+00	8.8E-01	6.6E-01			
1956 706	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.3E+01	5.0E+01	2.0E+01	9.6E+00	7.7E+00	6.6E+00
	6.0E+00	5.5E+00	4.0E+00	3.5E+00	2.2E+00	1.6E+00
	8.3E-01	6.0E-01	4.0E-01			
1957 669	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.3E+01	5.0E+01	2.3E+01	1.1E+01	[illegible]	6.4E+00
	5.6E+00	5.6E+00	5.0E+00	3.7E+00	2.8E+00	1.8E+00
	1.3E+00	7.3E-01	4.6E-01			
1958 661	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.7E+01	5.4E+01	2.1E+01	1.0E+01	7.1E+00	6.4E+00
	5.8E+00	5.7E+00	4.4E+00	3.7E+00	2.8E+00	1.9E+00
	1.3E+00	6.7E-01	3.8E-01			
1959 577	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.3E+01	5.2E+01	2.2E+01	1.2E+01	8.4E+00	7.0E+00
	7.1E+00	6.2E+00	5.1E+00	4.4E+00	3.0E+00	2.0E+00
	1.4E+00	6.4E-01	4.0E-01			

2000 619	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	6.9E+00	1.4E+02	2.0E+02	1.7E+02	6.7E+01	3.5E+01
	2.4E+01	1.6E+01	8.6E+00	8.3E+00	7.6E+00	6.4E+00
	6.1E+00	5.5E+00	5.3E+00			
2001 575	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	5.0E+00	1.3E+02	2.0E+02	1.9E+02	7.0E+01	3.8E+01
	2.6E+01	1.7E+01	8.9E+00	8.8E+00	8.7E+00	6.5E+00
	6.3E+00	5.5E+00	5.2E+00			
2002 573	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	4.4E+00	1.5E+02	6.6E+00	1.8E+02	7.8E+01	4.1E+01
	3.0E+01	2.0E+01	1.1E+01	9.4E+00	8.9E+00	6.6E+00
	6.3E+00	6.0E+00	5.6E+00			
2003 588	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	6.2E+00	1.3E+02	2.0E+02	1.7E+02	7.0E+01	3.8E+01
	2.6E+01	1.8E+01	1.0E+01	9.3E+00	8.8E+00	6.9E+00
	6.5E+00	5.9E+00	5.1E+00			
2004 651	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.0E+00	1.5E+01	7.1E+00	7.3E+00	6.8E+00	5.1E+00
	3.7E+00	2.4E+00	1.2E+00	4.1E-01	2.0E-01	8.4E-02
	6.6E-02	1.2E-02	2.9E-02			
2005 679	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.2E+00	1.5E+01	6.5E+00	6.1E+00	5.5E+00	4.4E+00
	2.9E+00	1.8E+00	7.9E-01	4.0E-01	1.1E-01	3.0E-02
	6.0E-03	0.0E-01	0.0E-01			
2006 771	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.4E+00	1.3E+01	5.7E+00	5.1E+00	4.6E+00	3.6E+00
	2.3E+00	1.3E+00	5.7E-01	3.0E-01	5.4E-02	1.2E-02
	1.2E-02	0.0E-01	0.0E-01			
2007 831	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.7E+00	1.4E+01	5.4E+00	4.6E+00	3.8E+00	2.9E+00
	1.9E+00	1.0E+00	4.6E-01	2.0E-01	6.6E-02	6.0E-03
	0.0E-01	0.0E-01	0.0E-01			
2008 1014	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.4E+01	2.2E+02	3.2E+02	3.7E+02	3.3E+02	2.2E+02
	1.3E+02	5.1E+01	2.5E+01	1.8E+01	1.4E+01	8.4E+00
	6.0E+00	4.0E+00	2.8E+00			
2009 1150	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.6E+01	1.8E+02	3.1E+02	6.5E+00	3.0E+02	2.0E+02
	1.2E+02	4.4E+01	2.2E+01	1.5E+01	1.1E+01	7.3E+00
	4.9E+00	2.7E+00	2.6E+00			
2010 1383	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.4E+01	1.8E+02	3.1E+02	1.9E-01	3.0E+02	1.9E+02
	1.1E+02	3.6E+01	1.5E+01	1.1E+01	7.7E+00	4.3E+00
	2.7E+00	2.0E+00	1.5E+00			

2011 1505	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	3.5E+01	7.2E+00	4.0E+00	2.6E+00	1.6E+00
	1.3E+00	1.0E+00	5.7E-01	4.1E-01	2.0E-01	1.1E-01
	8.5E-02	2.6E-02	1.7E-02			
2012 1620	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	3.1E+01	4.6E+00	2.0E+00	1.3E+00	1.0E+00
	9.6E-01	4.7E-01	2.9E-01	2.5E-01	1.5E-01	6.8E-02
	6.8E-02	1.7E-02	1.7E-02			
2013 1731	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	2.5E+01	2.7E+00	1.3E+00	1.1E+00	8.9E-01
	7.2E-01	4.2E-01	3.0E-01	2.3E-01	1.2E-01	6.0E-02
	2.6E-02	8.5E-03	0.0E-01			
2014 1816	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	3.3E+01	1.9E+01	1.9E+02	1.0E+02	2.2E+01	3.0E+00
	2.0E+00	1.3E+00	7.5E-01	5.7E-01	6.0E-01	2.7E-01
	4.6E-01	3.4E-01	3.8E-01			
2015 1582	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	3.0E+01	4.1E+01	2.0E+02	1.0E+02	1.8E+01	3.5E+00
	2.3E+00	1.6E+00	8.7E-01	8.2E-01	7.9E-01	4.6E-01
	4.6E-01	5.5E-01	3.4E-01			
2016 1537	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	2.6E+01	4.9E+01	2.2E+02	1.1E+02	1.9E+01	5.1E+00
	3.5E+00	1.9E+00	1.2E+00	8.8E-01	9.2E-01	6.5E-01
	5.0E-01	5.1E-01	4.1E-01			
2017 1429	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	2.3E+01	8.0E+00	2.2E+02	1.2E+02	2.2E+01	7.1E+00
	4.6E+00	2.6E+00	1.1E+00	1.0E+00	9.8E-01	5.6E-01
	4.6E-01	4.6E-01	3.8E-01			
2036 1219	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+02	2.8E+02	3.5E+02	3.8E+02	2.8E+02	1.5E+02
	9.4E+01	3.2E+01	1.2E+01	7.9E+00	5.8E+00	3.3E+00
	3.1E+00	9.4E-01	1.2E+00			
2037 1324	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	7.9E+01	2.5E+02	3.8E+02	4.8E+01	3.5E+02	1.8E+02
	1.1E+02	4.5E+01	1.5E+01	1.0E+01	6.4E+00	4.9E+00
	3.1E+00	1.6E+00	1.5E+00			
2038 1390	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+02	3.1E+02	3.7E+02	2.1E+01	3.0E+02	1.5E+02
	9.8E+01	3.7E+01	1.2E+01	8.3E+00	6.1E+00	4.1E+00
	2.4E+00	1.5E+00	8.9E-01			
2041 2143	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.4E+02	3.0E+02	3.7E+02	3.8E+02	2.5E+02	1.0E+02
	6.2E+01	2.2E+01	6.7E+00	2.4E+00	1.5E+00	1.3E+00
	7.3E-01	3.8E-01	1.3E-01			
2042 2298	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+02	3.2E+02	3.7E+02	3.6E+02	2.2E+02	8.6E+01
	5.2E+01	1.7E+01	3.5E+00	1.3E+00	9.4E-01	8.9E-01
	4.6E-01	2.5E-01	2.5E-01			
2043 2444	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+02	3.5E+02	3.8E+02	3.5E+02	2.0E+02	7.7E+01
	4.6E+01	1.6E+01	3.5E+00	1.1E+00	7.6E-01	4.6E-01
	4.1E-01	1.8E-01	1.5E-01			

2044 2625	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.0E+01	2.0E+01	3.1E+00	2.6E+00	1.3E+00	5.1E-01
	3.1E-01	1.0E-01	6.5E-02	2.8E-02	1.9E-02	2.8E-02
	0.0E-01	5.3E-03	0.0E-01			
2045 2758	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.2E+01	1.9E+01	1.4E+00	7.1E-01	2.9E-01	1.3E-01
	4.4E-02	2.8E-02	5.6E-02	9.3E-03	9.3E-03	9.3E-03
	9.3E-03	0.0E-01	0.0E-01			
2046 2861	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.1E+01	1.8E+01	1.0E+00	6.1E-01	2.3E-01	1.4E-01
	8.9E-02	1.9E-02	3.7E-02	9.3E-03	0.0E-01	0.0E-01
	0.0E-01	9.3E-03	9.3E-03			
2047 3016	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.6E+00	1.5E+01	1.0E+00	6.9E-01	2.4E-01	5.1E-02
	4.4E-02	3.7E-02	4.6E-02	2.8E-02	9.3E-03	9.3E-03
	0.0E-01	0.0E-01	0.0E-01			
2048 3336	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.3E+00	1.5E+01	1.0E+00	4.2E-01	1.8E-01	6.8E-02
	3.5E-02	1.9E-02	9.3E-03	0.0E-01	9.3E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2049 2806	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.2E+00	1.1E+01	7.4E-01	4.4E-01	1.9E-01	3.4E-02
	3.5E-02	1.9E-02	2.8E-02	1.9E-02	2.8E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2050 3059	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.8E+02	4.4E+02	3.0E+02	2.2E+02	1.0E+02	2.8E+01
	1.5E+01	5.4E+00	1.2E+00	6.8E-01	4.7E-01	3.3E-01
	2.6E-01	3.3E-01	2.3E-01			
2051 2258	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.2E+02	4.0E+02	3.2E+02	2.4E+02	1.2E+02	3.5E+01
	2.0E+01	7.1E+00	6.8E-01	1.1E+00	7.3E-01	5.9E-01
	4.2E-01	1.9E-01	1.4E-01			
2052 1837	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+02	2.8E+02	3.1E+02	2.8E+02	1.6E+02	5.4E+01
	3.0E+01	1.1E+01	2.8E+00	1.5E+00	1.4E+00	9.1E-01
	8.4E-01	6.8E-01	4.7E-01			
2057 2321	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.5E+02	4.3E+02	3.2E+02	2.4E+02	1.2E+02	4.1E+01
	2.3E+01	7.7E+00	1.6E+00	1.3E+00	1.0E+00	8.9E-01
	5.4E-01	2.3E-01	4.0E-01			
2058 2315	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.7E+02	4.8E+02	3.3E+02	2.6E+02	1.5E+02	5.1E+01
	2.9E+01	1.1E+01	2.5E+00	1.8E+00	1.3E+00	7.7E-01
	8.4E-01	4.9E-01	4.7E-01			
2059 2291	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.1E+02	3.3E+02	3.5E+02	3.2E+02	1.8E+02	6.9E+01
	4.2E+01	1.4E+01	4.4E+00	2.2E+00	1.9E+00	1.4E+00
	1.0E+00	7.0E-01	5.6E-01			

2100 1990	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	2.9E+01	2.2E+02	1.7E+02	7.0E+01	2.3E+01	4.9E+00
	3.9E+00	2.2E+00	1.1E+00	7.3E-01	6.1E-01	6.0E-01
	4.2E-01	2.8E-01	2.7E-01			
2101 2046	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	2.6E+01	2.2E+02	1.8E+02	7.4E+01	2.4E+01	5.0E+00
	3.3E+00	2.2E+00	1.3E+00	9.7E-01	7.3E-01	5.2E-01
	4.7E-01	3.6E-01	4.7E-01			
2102 1967	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	2.7E+01	2.2E+02	1.7E+02	6.8E+01	2.3E+01	6.0E+00
	3.5E+00	2.4E+00	1.4E+00	9.9E-01	1.0E+00	6.2E-01
	5.9E-01	4.9E-01	4.7E-01			
2115 561	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	6.9E+00	2.1E+02	4.0E+01	2.0E+02	8.0E+01	4.4E+01
	3.2E+01	2.2E+01	1.3E+01	9.6E+00	9.5E+00	7.2E+00
	6.5E+00	5.0E+00	5.6E+00			
2116 560	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	6.6E+00	1.7E+02	6.9E+00	1.7E+02	7.4E+01	4.0E+01
	3.0E+01	2.1E+01	1.2E+01	8.9E+00	8.9E+00	5.9E+00
	5.6E+00	4.7E+00	4.3E+00			
2117 577	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 2	7.0E+00	1.8E+02	2.2E+02	1.7E+02	6.8E+01	3.7E+01
	2.8E+01	1.8E+01	1.1E+01	8.5E+00	7.8E+00	5.6E+00
	4.9E+00	4.6E+00	4.2E+00			
2119 599	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 3	1.7E+01	6.1E+01	3.2E+01	2.0E+01	1.2E+01	8.0E+00
	6.5E+00	5.2E+00	4.5E+00	3.6E+00	2.9E+00	2.0E+00
	1.3E+00	8.9E-01	7.3E-01			
2120 651	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 3	1.6E+01	6.1E+01	3.1E+01	2.0E+01	1.1E+01	7.5E+00
	5.8E+00	4.8E+00	3.9E+00	3.0E+00	2.8E+00	2.0E+00
	1.5E+00	1.1E+00	6.1E-01			
2121 706	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
AISP 3	1.8E+01	6.6E+01	3.1E+01	1.8E+01	9.8E+00	6.9E+00
	5.1E+00	4.4E+00	3.3E+00	3.2E+00	2.3E+00	1.7E+00
	1.2E+00	7.7E-01	5.5E-01			

2125 1062	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+01	5.6E+01	2.3E+01	1.4E+01	6.8E+00	4.1E+00
	2.1E+00	1.8E+00	1.0E+00	8.9E-01	5.1E-01	5.2E-01
	1.6E-01	1.4E-01	5.2E-02			
2126 1220	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.3E+01	5.4E+01	1.8E+01	9.0E+00	4.1E+00	2.6E+00
	1.4E+00	1.1E+00	5.2E-01	3.6E-01	2.0E-01	1.8E-01
	4.2E-02	8.3E-02	2.1E-02			
2127 1428	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E+01	5.3E+01	1.8E+01	9.7E+00	4.5E+00	1.8E+00
	1.2E+00	7.5E-01	4.8E-01	3.7E-01	1.2E-01	9.4E-02
	6.2E-02	0.0E-01	3.1E-02			
2128 1398	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+01	4.6E+01	1.2E+01	6.8E+00	3.2E+00	1.9E+00
	8.3E-01	4.4E-01	3.2E-01	1.4E-01	9.4E-02	1.0E-02
	2.1E-02	2.1E-02	0.0E-01			
2129 1426	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.6E+01	5.4E+01	1.4E+01	6.7E+00	3.1E+00	1.5E+00
	8.2E-01	3.9E-01	2.9E-01	1.5E-01	4.2E-02	6.2E-02
	1.0E-02	0.0E-01	0.0E-01			
2130 1912	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.7E+01	5.1E+01	1.3E+01	6.9E+00	2.9E+00	1.3E+00
	5.0E-01	4.1E-01	2.6E-01	1.8E-01	1.1E-01	2.1E-02
	0.0E-01	2.1E-02	0.0E-01			
2131 2230	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.9E+01	3.6E+01	7.2E+00	4.4E+00	1.9E+00	7.4E-01
	4.3E-01	2.4E-01	5.2E-02	7.3E-02	0.0E-01	1.0E-02
	1.0E-02	1.0E-02	0.0E-01			
2132 2549	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.4E+01	2.8E+01	5.8E+00	3.5E+00	1.1E+00	4.6E-01
	2.1E-01	8.3E-02	3.1E-02	1.0E-02	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2133 2746	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.1E+01	2.1E+01	4.2E+00	2.3E+00	7.7E-01	1.7E-01
	7.9E-02	4.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2134 2828	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.9E+00	1.6E+01	3.9E+00	2.0E+00	5.6E-01	1.7E-01
	4.9E-02	3.1E-02	1.0E-02	2.1E-02	2.1E-02	2.1E-02
	1.0E-02	1.0E-02	2.1E-02			
2135 3135	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.3E+00	1.4E+01	3.7E+00	1.7E+00	4.6E-01	2.8E-01
	1.7E-01	1.1E-01	6.2E-02	1.2E-01	4.2E-02	4.2E-02
	0.0E-01	1.0E-02	2.1E-02			
2136 3311	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.8E+00	1.2E+01	2.9E+00	9.2E-01	3.4E-01	8.5E-02
	1.1E-01	3.1E-02	4.2E-02	2.1E-02	0.0E-01	0.0E-01
	0.0E-01	1.0E-02	0.0E-01			
2137 3575	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	6.8E+00	1.0E+01	1.8E+00	9.2E-01	1.9E-01	9.4E-02
	0.0E-01	2.1E-02	1.0E-02	1.0E-02	1.0E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			

Fog 10BS. August 7-8 (Day 219-220) 1975

DAY 219 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

2319 5306	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	7.4E+01	9.0E+01	6.9E+01	4.9E+01	8.1E+00
	5.4E+00	1.9E+00	4.7E-01	3.7E-01	2.5E-01	2.3E-01
	1.7E-01	9.6E-02	6.1E-02			
2320 5285	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	7.5E+01	8.8E+01	6.7E+01	5.5E+01	8.2E+00
	5.6E+00	1.8E+00	4.5E-01	3.3E-01	3.0E-01	2.0E-01
	2.0E-01	8.7E-02	8.7E-02			
2321 4833	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.4E+01	7.9E+01	9.4E+01	6.8E+01	5.6E+01	8.8E+00
	5.3E+00	2.3E+00	7.4E-01	3.1E-01	3.9E-01	2.2E-01
	2.3E-01	1.1E-01	6.1E-02			
2322 5039	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	7.1E+01	8.8E+01	7.2E+01	5.5E+01	8.6E+00
	6.0E+00	2.2E+00	4.7E-01	3.9E-01	3.8E-01	2.4E-01
	1.7E-01	1.3E-01	6.1E-02			
2323 4943	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.3E+01	8.3E+01	8.9E+01	6.7E+01	5.8E+01	9.2E+00
	5.5E+00	2.3E+00	6.2E-01	3.6E-01	4.1E-01	3.4E-01
	2.4E-01	9.6E-02	5.2E-02			
2324 4893	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+01	8.2E+01	9.8E+01	7.2E+01	5.9E+01	1.2E+01
	6.1E+00	2.2E+00	7.6E-01	5.8E-01	3.0E-01	3.0E-01
	2.3E-01	2.3E-01	1.2E-01			
2325 4643	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.2E+00	8.8E+01	1.0E+02	7.7E+01	6.0E+01	1.1E+01
	6.7E+00	2.4E+00	5.0E-01	4.5E-01	4.5E-01	3.0E-01
	2.3E-01	1.5E-01	1.0E-01			
2326 4452	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	9.0E+01	9.8E+01	7.2E+01	6.0E+01	9.6E+00
	7.0E+00	2.5E+00	5.1E-01	3.6E-01	5.0E-01	3.9E-01
	2.0E-01	9.6E-02	6.9E-02			
2327 4075	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.3E+01	8.2E+01	9.2E+01	7.1E+01	5.9E+01	1.0E+01
	6.8E+00	2.6E+00	7.3E-01	6.2E-01	5.2E-01	3.0E-01
	2.5E-01	1.0E-01	6.9E-02			
2328 4483	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	8.7E+01	9.6E+01	6.9E+01	6.1E+01	1.1E+01
	7.5E+00	2.9E+00	8.0E-01	5.4E-01	3.9E-01	3.9E-01
	2.8E-01	1.6E-01	1.3E-01			
2329 3988	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.3E+00	7.3E+01	1.0E+02	7.7E+01	6.4E+01	1.4E+01
	8.5E+00	3.2E+00	8.9E-01	6.7E-01	4.5E-01	4.3E-01
	3.9E-01	1.2E-01	9.6E-02			
2330 4101	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	8.6E+01	1.1E+02	8.1E+01	6.7E+01	1.4E+01
	9.3E+00	3.3E+00	1.1E+00	7.6E-01	4.9E-01	3.6E-01
	2.8E-01	2.4E-01	1.6E-01			
2331 3790	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	8.0E+00	9.3E+01	1.2E+02	8.9E+01	6.8E+01	1.7E+01
	1.1E+01	4.1E+00	9.6E-01	7.8E-01	6.4E-01	4.2E-01
	4.2E-01	2.3E-01	1.7E-01			

2332 3457	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.3E+01	9.1E+01	1.1E+02	8.9E+01	7.6E+01	1.9E+01
	1.3E+01	4.7E+00	1.3E+00	6.9E-01	7.6E-01	4.8E-01
	4.2E-01	2.1E-01	2.5E-01			
2333 3391	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.4E+00	6.1E+01	7.5E+01	1.6E+01	1.1E+01	2.5E+00
	1.2E+00	9.5E-01	5.6E-01	2.8E-01	3.2E-01	1.9E-01
	1.6E-01	1.5E-01	1.3E-01			
2334 2924	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	1.1E+00	6.1E+01	7.5E+01	1.8E+01	1.1E+01	2.2E+00
	1.3E+00	8.7E-01	5.3E-01	3.2E-01	2.6E-01	2.3E-01
	1.5E-01	1.1E-01	1.3E-01			
2336 2180	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.6E+00	1.2E+01	2.2E+00	1.3E+00	5.5E-01	3.7E-01
	2.9E-01	2.9E-01	2.5E-01	2.3E-01	2.0E-01	2.0E-01
	2.8E-01	2.0E-01	1.7E-01			
2337 1840	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	6.2E+00	1.3E+01	2.2E+00	1.2E+00	5.5E-01	4.0E-01
	2.8E-01	2.6E-01	3.1E-01	1.9E-01	2.4E-01	1.8E-01
	1.9E-01	2.1E-01	1.9E-01			
2338 1713	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.3E-01	1.3E+00	6.8E-01	4.4E-01	2.9E-01	2.8E-01
	2.3E-01	2.8E-01	2.8E-01	2.4E-01	2.6E-01	2.5E-01
	2.1E-01	1.6E-01	1.6E-01			
2339 1495	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E-01	1.2E+00	5.8E-01	3.0E-01	1.9E-01	2.0E-01
	1.9E-01	2.3E-01	2.4E-01	2.4E-01	2.6E-01	2.1E-01
	2.4E-01	1.7E-01	1.3E-01			
2340 1370	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.4E-01	1.4E+00	7.9E-01	5.6E-01	4.2E-01	3.3E-01
	2.8E-01	3.3E-01	2.7E-01	2.7E-01	2.8E-01	2.9E-01
	2.3E-01	2.2E-01	1.9E-01			
2341 1292	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.4E-01	1.8E+00	9.9E-01	6.3E-01	4.5E-01	4.7E-01
	4.2E-01	4.0E-01	3.5E-01	3.0E-01	3.6E-01	3.0E-01
	2.7E-01	2.4E-01	2.0E-01			
2342 1131	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.4E-01	2.2E+00	1.0E+00	6.3E-01	4.1E-01	3.2E-01
	2.8E-01	3.2E-01	3.4E-01	2.8E-01	3.3E-01	2.7E-01
	3.2E-01	2.6E-01	2.3E-01			
2343 941	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.1E-01	2.2E+00	1.1E+00	8.5E-01	4.9E-01	4.3E-01
	3.5E-01	3.6E-01	3.5E-01	3.8E-01	3.9E-01	3.9E-01
	3.4E-01	3.2E-01	2.3E-01			
2344 995	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	6.9E-01	3.3E+00	1.3E+00	9.1E-01	6.8E-01	5.1E-01
	3.4E-01	3.6E-01	3.1E-01	2.9E-01	3.7E-01	3.5E-01
	3.3E-01	3.2E-01	2.6E-01			

2345 865	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	8.2E-01	2.6E+00	1.2E+00	1.1E+00	7.6E-01	6.3E-01
	4.5E-01	5.3E-01	4.8E-01	4.3E-01	4.4E-01	4.2E-01
	3.5E-01	3.4E-01	2.4E-01			
2346 745	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.0E+00	3.9E+00	2.1E+00	1.4E+00	9.5E-01	8.7E-01
	6.1E-01	6.4E-01	6.0E-01	5.4E-01	5.4E-01	5.0E-01
	3.8E-01	2.8E-01	3.0E-01			
2347 679	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.0E+00	4.8E+00	2.0E+00	1.4E+00	9.2E-01	7.6E-01
	5.3E-01	5.1E-01	5.9E-01	5.9E-01	5.5E-01	4.4E-01
	5.1E-01	3.7E-01	3.2E-01			
2348 589	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	6.0E+00	2.5E+00	1.6E+00	9.5E-01	8.4E-01
	6.9E-01	7.6E-01	6.7E-01	6.8E-01	7.2E-01	5.8E-01
	5.3E-01	4.6E-01	3.3E-01			
2349 537	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	6.6E+00	2.7E+00	1.7E+00	9.8E-01	9.1E-01
	7.0E-01	7.3E-01	7.4E-01	7.3E-01	7.4E-01	6.5E-01
	6.9E-01	5.0E-01	3.5E-01			
2350 559	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	6.4E+00	2.9E+00	2.0E+00	1.3E+00	1.1E+00
	9.8E-01	9.8E-01	9.5E-01	9.0E-01	9.3E-01	7.9E-01
	7.1E-01	5.5E-01	4.0E-01			
2351 500	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E+00	6.4E+00	3.5E+00	2.3E+00	1.7E+00	1.4E+00
	1.1E+00	1.1E+00	9.3E-01	9.2E-01	8.9E-01	7.9E-01
	6.9E-01	5.5E-01	3.9E-01			
2352 495	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E+00	7.3E+00	3.7E+00	2.4E+00	1.6E+00	1.4E+00
	1.0E+00	1.1E+00	9.9E-01	9.4E-01	9.1E-01	8.5E-01
	8.2E-01	6.3E-01	4.5E-01			
2353 457	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.3E+00	7.0E+00	3.4E+00	2.4E+00	1.9E+00	1.8E+00
	1.5E+00	1.4E+00	1.5E+00	1.3E+00	1.1E+00	1.1E+00
	8.4E-01	7.2E-01	3.9E-01			
2354 459	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.3E+00	8.5E+00	4.0E+00	2.8E+00	1.9E+00	1.7E+00
	1.4E+00	1.5E+00	1.3E+00	1.3E+00	1.2E+00	1.1E+00
	9.0E-01	6.6E-01	4.4E-01			
2355 465	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.9E-01	8.0E+00	4.3E+00	2.8E+00	2.3E+00	2.0E+00
	1.7E+00	1.9E+00	1.7E+00	1.5E+00	1.4E+00	1.2E+00
	9.4E-01	7.2E-01	5.0E-01			
2356 403	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	8.9E-01	7.9E+00	4.6E+00	3.1E+00	2.1E+00	2.1E+00
	1.7E+00	1.8E+00	1.6E+00	1.6E+00	1.4E+00	1.2E+00
	9.4E-01	7.4E-01	4.6E-01			
2357 382	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.6E-01	7.9E+00	5.1E+00	3.5E+00	2.5E+00	2.4E+00
	1.9E+00	2.1E+00	2.0E+00	1.9E+00	1.7E+00	1.3E+00
	1.1E+00	7.6E-01	4.6E-01			

2358 40[illegible]	0.[illegible]E-01	0.[illegible]E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	1.[illegible]E+00	9.[illegible]E+00	5.1E+00	3.3E+00	2.6E+00	2.5E+00
	2.[illegible]E+00	2.4E+00	2.1E+00	1.9E+00	1.8E+00	1.5E+00
	1.[illegible]E+00	9.[illegible]E-01	5.6E-01			
2359 36[illegible]	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	1.1E+00	9.8E+00	5.5E+00	3.7E+00	2.5E+00	2.5E+00
	2.2E+00	2.5E+00	2.1E+00	1.9E+00	1.8E+00	1.5E+00
	1.2E+00	8.3E-01	5.9E-01			
0000 375	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	7.3E-01	8.3E+00	5.3E+00	3.6E+00	2.8E+00	2.9E+00
	2.5E+00	2.7E+00	2.3E+00	2.4E+00	2.0E+00	1.6E+00
	1.3E+00	9.4E-01	5.0E-01			
0001 358	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	1.0E+00	9.3E+00	5.3E+00	3.5E+00	2.7E+00	2.6E+00
	2.1E+00	2.4E+00	2.1E+00	1.8E+00	1.7E+00	1.4E+00
	1.2E+00	8.7E-01	5.2E-01			
0002 327	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	5.5E-01	8.7E+00	6.0E+00	4.1E+00	3.2E+00	3.0E+00
	2.4E+00	2.7E+00	2.4E+00	2.2E+00	2.0E+00	1.6E+00
	1.3E+00	9.7E-01	6.2E-01			
0003 331	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	5.1E-01	7.1E+00	5.6E+00	4.2E+00	3.2E+00	3.2E+00
	2.8E+00	3.0E+00	2.5E+00	2.2E+00	2.0E+00	1.6E+00
	1.3E+00	9.1E-01	5.6E-01			
0004 370	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	6.0E-01	8.0E+00	6.2E+00	4.5E+00	3.7E+00	3.1E+00
	2.5E+00	2.5E+00	2.1E+00	1.6E+00	1.8E+00	1.3E+00
	1.1E+00	7.7E-01	4.6E-01			
0005 302	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	2.5E-01	6.4E+00	5.6E+00	4.6E+00	3.8E+00	3.4E+00
	2.9E+00	2.9E+00	2.7E+00	2.5E+00	2.0E+00	1.7E+00
	1.2E+00	8.0E-01	4.8E-01			
0006 317	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	3.0E-01	6.9E+00	5.6E+00	4.5E+00	3.5E+00	3.3E+00
	2.6E+00	2.8E+00	2.4E+00	2.0E+00	1.8E+00	1.4E+00
	1.1E+00	7.6E-01	4.5E-01			
0007 331	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	4.8E-01	7.3E+00	6.5E+00	5.1E+00	4.1E+00	3.9E+00
	3.0E+00	3.2E+00	2.9E+00	2.3E+00	2.3E+00	1.7E+00
	1.2E+00	8.2E-01	5.2E-01			
0008 349	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	2.0E-01	5.7E+00	5.4E+00	4.5E+00	4.2E+00	4.1E+00
	3.5E+00	3.7E+00	3.3E+00	2.6E+00	2.5E+00	2.0E+00
	1.3E+00	8.5E-01	4.5E-01			
0009 292	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	1.7E-01	5.8E+00	4.7E+00	3.8E+00	3.9E+00	3.8E+00
	3.6E+00	4.1E+00	3.5E+00	3.2E+00	2.7E+00	2.0E+00
	1.4E+00	7.5E-01	3.9E-01			
0010 301	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASIP 1	9.1E-02	4.6E+00	4.2E+00	3.6E+00	3.4E+00	3.7E+00
	3.4E+00	4.0E+00	3.7E+00	3.3E+00	2.7E+00	2.0E+00
	1.3E+00	8.0E-01	3.8E-01			

0011 302	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	9.6E-02	5.2E+00	4.3E+00	3.7E+00	3.5E+00	3.5E+00
	3.1E+00	3.7E+00	3.5E+00	3.0E+00	2.6E+00	1.9E+00
	1.4E+00	7.6E-01	3.4E-01			
0012 316	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.3E-01	4.7E+00	4.1E+00	3.3E+00	3.4E+00	3.5E+00
	3.4E+00	3.9E+00	3.6E+00	3.2E+00	2.9E+00	2.2E+00
	1.5E+00	7.5E-01	3.5E-01			
0013 324	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E-01	5.6E+00	4.9E+00	4.0E+00	4.2E+00	4.2E+00
	3.7E+00	4.0E+00	3.6E+00	3.1E+00	2.6E+00	1.8E+00
	1.3E+00	6.8E-01	2.9E-01			
0014 308	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.7E-01	4.9E+00	5.5E+00	5.1E+00	5.6E+00	5.4E+00
	4.5E+00	4.7E+00	3.9E+00	3.1E+00	2.4E+00	1.8E+00
	1.2E+00	5.9E-01	3.0E-01			
0015 310	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.8E-01	4.9E+00	5.5E+00	4.9E+00	5.2E+00	5.2E+00
	4.7E+00	4.8E+00	3.9E+00	3.2E+00	2.5E+00	1.8E+00
	1.2E+00	6.3E-01	2.7E-01			
0016 273	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E-01	4.5E+00	5.2E+00	4.8E+00	5.0E+00	4.8E+00
	4.1E+00	4.5E+00	3.7E+00	3.2E+00	2.5E+00	1.8E+00
	1.2E+00	6.6E-01	3.0E-01			
0017 309	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.3E-02	4.7E+00	5.0E+00	4.4E+00	4.4E+00	4.1E+00
	3.9E+00	4.1E+00	3.5E+00	3.3E+00	2.6E+00	1.8E+00
	1.3E+00	7.7E-01	3.6E-01			
0018 308	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.3E-02	4.1E+00	4.6E+00	4.0E+00	4.4E+00	4.0E+00
	3.6E+00	3.7E+00	3.6E+00	3.0E+00	2.6E+00	1.9E+00
	1.4E+00	8.0E-01	3.1E-01			

0119 [illegible]	0.0E-01	0.[illegible]-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 1	[illegible]	1.[illegible]	1.0E+01	9.6E+00	8.4E+00	8.3E+00
	7.2E+00	5.[illegible]E+00	2.4E+00	1.9E+00	4.9E-01	7.9E-02
	4.0E-02	2.6E-02	0.0E-01			
0120 [illegible]	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 1	3.0E+00	1.2E+01	9.5E+00	8.6E+00	8.6E+00	8.7E+00
	7.[illegible]E+00	6.1E+00	4.3E+00	2.2E+00	1.1E+00	2.4E-01
	5.[illegible]E-02	2.6E-02	0.0E-01			
0121 247	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 1	5.1E+00	1.4E+01	1.1E+01	9.0E+00	9.5E+00	8.9E+00
	6.9E+00	5.7E+00	3.6E+00	2.6E+00	1.3E+00	3.2E-01
	9.2E-02	1.3E-02	0.0E-01			
0122 278	0.0E-01	0.0E-01	0.0E-01	0/0E-01	0.0E-01	0.0E-01
ADSP 1	4.5E+00	1.6E+01	1.1E+01	9.4E+00	8.3E+00	8.8E+00
	7.4E+00	6.2E+00	4.1E+00	2.4E+00	1.3E+00	3.2E-01
	1.3E-01	2.6E-02	2.5E-02			
0123 253	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 2	3.6E+01	3.5E+02	3.4E+02	2.2E+02	5.6E+01	4.0E+01
	2.9E+01	2.0E+01	1.4E+01	1.2E+01	9.6E+00	8.5E+00
	7.6E+00	6.9E+00	7.0E+00			
0124 274	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 2	3.9E+01	3.0E+02	3.2E+02	2.0E+02	5.2E+01	3.7E+01
	2.5E+01	1.7E+01	1.1E+01	1.2E+01	1.0E+01	7.7E+00
	6.1E+00	5.8E+00	6.1E+00			
0125 278	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 3	2.7E+01	5.5E+01	2.8E+01	1.6E+01	1.2E+01	9.0E+00
	7.7E+00	7.5E+00	6.6E+00	6.5E+00	5.9E+00	4.6E+00
	3.9E+00	2.4E+00	1.8E+00			
0126 276	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 3	3.0E+01	5.0E+01	2.4E+01	1.4E+01	1.1E+01	7.8E+00
	6.7E+00	6.3E+00	5.9E+00	5.8E+00	4.4E+00	3.8E+00
	2.9E+00	1.9E+00	1.5E+00			
0127 269	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 4	6.2E+02	5.3E+02	5.1E+02	4.9E+02	4.0E+02	2.8E+02
	1.5E+02	4.8E+01	3.2E+01	2.4E+01	1.8E+01	1.5E+01
	1.0E+01	1.1E+01	7.9E+00			
0128 300	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ADSP 4	1.2E+03	7.6E+02	5.5E+02	5.1E+02	3.8E+02	2.6E+02
	1.4E+02	4.6E+01	2.7E+01	2.1E+01	1.7E+01	1.2E+01
	9.1E+00	8.3E+00	6.1E+00			

0129 311	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.5E+00	1.2E+01	1.1E+01	7.9E+00	7.2E+00	6.9E+00
	5.4E+00	4.[illegible]E+00	2.8E+00	1.3E+00	4.8E-01	2.2E-01
	9.6E-02	7.[illegible]E-02	2.[illegible]E-02			
0130 2[illegible]	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	[illegible].8E+00	1.2E+01	8.4E+00	6.6E+00	6.6E+00	6.2E+00
	5.3E+00	4.2E+00	2.5E+00	1.6E+00	4.7E-01	1.3E-01
	7.2E-02	8.4E-02	2.3E-02			
0131 315	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.9E+00	1.2E+01	7.0E+00	5.7E+00	5.7E+00	5.6E+00
	4.8E+00	4.0E+00	2.6E+00	1.5E+00	5.4E-01	1.8E-01
	3.6E-02	2.4E-02	1.2E-02			
0132 332	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.3E+00	1.3E+01	8.6E+00	6.4E+00	6.0E+00	6.0E+00
	5.5E+00	4.1E+00	2.7E+00	1.6E+00	6.2E-01	1.2E-01
	8.4E-02	3.6E-02	3.5E-02			
0133 324	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.9E+00	1.3E+01	8.2E+00	5.6E+00	5.3E+00	5.0E+00
	4.5E+00	3.1E+00	2.3E+00	1.1E+00	6.0E-01	1.6E-01
	6.0E-02	1.2E-02	0.0E-01			
0134 335	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.5E+00	1.3E+01	8.5E+00	5.9E+00	4.8E+00	4.7E+00
	4.1E+00	3.2E+00	1.9E+00	1.3E+00	7.0E-01	3.0E-01
	1.2E-01	2.4E-02	0.0E-01			
0140 295	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.3E-02	2.0E+00	4.2E+00	4.4E+00	5.1E+00	5.3E+00
	4.6E+00	4.1E+00	2.9E+00	2.0E+00	1.2E+00	6.2E-01
	1.7E-01	6.9E-02	2.9E-02			
0141 329	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E-01	3.3E+00	4.7E+00	4.3E+00	5.2E+00	5.7E+00
	5.1E+00	5.3E+00	4.0E+00	3.0E+00	2.1E+00	1.2E+00
	5.3E-01	1.6E-01	4.5E-02			
0142 308	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.0E-01	3.3E+00	4.8E+00	5.0E+00	5.7E+00	6.3E+00
	5.4E+00	5.3E+00	4.1E+00	3.3E+00	2.2E+00	1.2E+00
	4.8E-01	9.1E-02	3.1E-02			
0143 340	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E-01	3.0E+00	4.3E+00	4.6E+00	5.5E+00	6.4E+00
	5.8E+00	6.1E+00	4.5E+00	3.5E+00	2.5E+00	1.4E+00
	5.3E-01	1.6E-01	5.5E-02			
0144 333	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.3E-02	2.5E+00	4.6E+00	5.6E+00	7.0E+00	7.5E+00
	6.5E+00	6.6E+00	5.0E+00	3.9E+00	2.7E+00	1.5E+00
	5.3E-01	1.2E-01	5.3E-02			
0145 245	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.6E-02	2.7E+00	4.2E+00	4.2E+00	5.6E+00	6.7E+00
	6.1E+00	6.1E+00	4.9E+00	3.7E+00	2.7E+00	1.4E+00
	4.3E-01	1.2E-01	2.9E-02			

0146	264	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		1.2E+00	8.1E+00	1.1E+01	6.4E+00	7.5E+00	6.6E+00
		6.6E+00	6.6E+00	6.6E+00	6.0E+00	5.3E+00	4.9E+00
		4.2E+00	3.6E+00	3.0E+00			
0147	265	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		1.2E+00	8.1E+00	1.1E+01	6.7E+00	8.0E+00	7.0E+00
		6.5E+00	7.2E+00	6.6E+00	5.9E+00	5.6E+00	4.7E+00
		4.1E+00	3.5E+00	2.7E+00			
0148	243	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3		1.4E+00	8.3E+00	1.1E+01	7.2E+00	8.2E+00	7.1E+00
		6.7E+00	6.7E+00	6.7E+00	5.7E+00	5.2E+00	4.8E+00
		3.9E+00	3.4E+00	2.6E+00			
0149	260	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2		7.6E-01	1.2E+01	6.8E+01	5.8E+01	2.1E+01	1.6E+01
		1.2E+01	8.2E+00	6.9E+00	6.3E+00	5.9E+00	4.4E+00
		4.1E+00	4.0E+00	4.4E+00			
0150	251	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2		8.6E-01	1.3E+01	6.9E+01	6.0E+01	1.9E+01	1.5E+01
		1.0E+01	7.6E+00	6.9E+00	6.2E+00	5.6E+00	4.8E+00
		4.3E+00	4.1E+00	4.3E+00			
0151	256	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2		8.5E-01	1.3E+01	6.4E+01	5.4E+01	1.8E+01	1.5E+01
		1.1E+01	8.4E+00	7.6E+00	6.6E+00	6.1E+00	4.9E+00
		4.9E+00	4.3E+00	4.6E+00			
0152	238	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		6.4E+00	2.2E+01	6.8E+01	9.0E+01	9.7E+01	8.8E+01
		3.4E+01	1.5E+01	1.2E+01	9.6E+00	7.2E+00	5.8E+00
		4.9E+00	4.7E+00	4.5E+00			
0153	245	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		6.8E+00	1.7E+01	6.2E+01	8.6E+01	9.6E+01	9.0E+01
		3.0E+01	1.6E+01	1.3E+01	9.9E+00	7.2E+00	5.9E+00
		5.5E+00	4.8E+00	4.2E+00			
0154	248	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4		1.6E+01	2.8E+01	6.8E+01	8.8E+01	9.5E+01	8.7E+01
		3.2E+01	1.4E+01	1.2E+01	9.8E+00	7.1E+00	5.7E+00
		4.7E+00	4.1E+00	4.2E+00			
0155	208	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		5.8E-02	1.7E+00	3.6E+00	4.6E+00	5.6E+00	6.7E+00
		6.2E+00	6.9E+00	5.6E+00	4.1E+00	2.6E+00	1.1E+00
		3.2E-01	1.1E-01	7.1E-02			
0156	207	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		5.1E-02	1.2E+00	3.5E+00	4.2E+00	5.4E+00	7.2E+00
		7.6E+00	8.5E+00	7.1E+00	5.3E+00	3.5E+00	1.6E+00
		5.3E-01	1.5E-01	4.3E-02			
0157	230	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1		6.1E-02	1.9E+00	3.7E+00	4.3E+00	5.3E+00	7.2E+00
		7.2E+00	7.9E+00	6.5E+00	4.7E+00	3.0E+00	1.2E+00
		4.4E-01	1.3E-01	5.7E-02			

0215 222	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.1E-02	3.6E+00	7.1E+00	7.1E+00	7.6E+00	9.0E+00
	8.1E+00	7.6E+00	5.4E+00	3.1E+00	1.7E+00	7.0E-01
	3.1E-01	1.1E-01	4.9E-02			
0216 221	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.8E-02	2.9E+00	5.8E+00	5.8E+00	7.0E+00	8.5E+00
	7.9E+00	7.2E+00	4.8E+00	3.1E+00	1.6E+00	6.4E-01
	2.9E-01	1.2E-01	6.7E-02			
0217 237	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.2E-01	3.4E+00	5.8E+00	5.2E+00	6.2E+00	5.0E+00
	7.3E+00	6.7E+00	4.6E+00	2.6E+00	1.2E+00	5.0E-01
	2.0E-01	1.0E-01	4.9E-02			
0230 241	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.8E-01	4.7E+00	5.4E+00	3.7E+00	3.9E+00	4.7E+00
	4.4E+00	4.4E+00	3.5E+00	2.5E+00	1.5E+00	8.6E-01
	5.2E-01	2.4E-01	8.4E-02			
0231 258	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.9E-01	5.3E+00	5.9E+00	3.8E+00	4.0E+00	4.8E+00
	4.7E+00	4.6E+00	3.7E+00	2.6E+00	1.7E+00	9.6E-01
	5.0E-01	2.6E-01	1.1E-01			
0232 233	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.3E-01	4.2E+00	5.5E+00	4.0E+00	4.4E+00	5.6E+00
	5.3E+00	5.5E+00	4.2E+00	2.9E+00	1.9E+00	1.0E+00
	5.4E-01	2.6E-01	1.3E-01			
0245 286	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.4E-01	5.0E+00	6.6E+00	5.3E+00	5.7E+00	6.0E+00
	4.9E+00	4.7E+00	3.2E+00	1.9E+00	1.1E+00	5.1E-01
	2.3E-01	9.7E-02	3.3E-02			
0246 276	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.5E-01	4.9E+00	6.7E+00	5.2E+00	5.6E+00	5.7E+00
	4.7E+00	4.4E+00	2.8E+00	1.7E+00	1.0E+00	4.6E-01
	2.5E-01	8.9E-02	4.3E-02			
0247 286	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.7E-01	4.7E+00	6.5E+00	5.3E+00	5.8E+00	6.0E+00
	4.9E+00	4.6E+00	3.0E+00	1.9E+00	9.5E-01	4.2E-01
	2.4E-01	1.2E-01	4.3E-02			
0300 257	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	9.6E-02	2.5E+00	4.5E+00	5.8E+00	7.2E+00	8.4E+00
	7.2E+00	7.0E+00	4.8E+00	2.9E+00	1.4E+00	5.9E-01
	2.7E-01	9.9E-02	4.9E-02			
0301 258	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	6.1E-02	2.7E+00	4.8E+00	5.9E+00	6.7E+00	7.7E+00
	6.9E+00	6.5E+00	4.4E+00	2.8E+00	1.4E+00	5.9E-01
	2.5E-01	1.1E-01	3.3E-02			
0302 255	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.4E-02	2.5E+00	4.6E+00	5.7E+00	6.7E+00	7.9E+00
	7.1E+00	6.9E+00	4.8E+00	2.9E+00	1.5E+00	6.0E-01
	2.5E-01	1.1E-01	3.9E-02			

0315 326	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.9E-01	3.[illegible]E+00	4.4E+00	4.4E+00	5.3E+00	6.0E+00
	5.6E+00	5.4E+00	4.1E+00	2.8E+00	1.5E+00	6.3E-01
	2.3E-01	1.4E-01	6.7E-02			
0316 301	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	4.2E-01	4.0E+00	4.8E+00	4.4E+00	5.1E+00	6.1E+00
	5.4E+00	5.1E+00	3.8E+00	2.7E+00	1.4E+00	6.0E-01
	2.2E-01	1.1E-01	6.1E-02			
0317 277	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.9E-01	4.0E+00	4.8E+00	4.3E+00	5.2E+00	6.0E+00
	5.6E+00	5.3E+00	4.1E+00	3.0E+00	1.7E+00	6.6E-01
	2.4E-01	1.3E-01	6.3E-02			
0330 250	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.7E-01	2.6E+00	3.7E+00	4.4E+00	6.4E+00	7.5E+00
	7.4E+00	7.2E+00	5.5E+00	3.8E+00	2.1E+00	8.1E-01
	2.7E-01	1.3E-01	6.9E-02			
0331 238	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.3E-01	2.0E+00	3.7E+00	4.9E+00	7.0E+00	8.1E+00
	7.7E+00	7.5E+00	5.8E+00	4.0E+00	2.1E+00	8.5E-01
	3.3E-01	1.2E-01	7.5E-02			
0332 246	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E-01	1.6E+00	3.6E+00	4.8E+00	6.6E+00	8.1E+00
	7.7E+00	7.6E+00	5.9E+00	4.0E+00	2.3E+00	9.0E-01
	3.5E-01	1.6E-01	7.3E-02			
0344 278	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E-01	2.0E+00	2.7E+00	3.8E+00	4.8E+00	5.4E+00
	5.2E+00	5.8E+00	4.6E+00	3.1E+00	1.8E+00	6.6E-01
	2.8E-01	1.3E-01	6.5E-02			
0345 308	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.3E-02	2.0E+00	3.0E+00	3.7E+00	4.6E+00	5.2E+00
	4.7E+00	5.5E+00	4.3E+00	3.2E+00	1.9E+00	9.1E-01
	3.2E-01	1.2E-01	7.8E-02			
0346 261	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	8.9E-02	1.8E+00	2.7E+00	3.8E+00	4.8E+00	5.3E+00
	5.3E+00	5.5E+00	4.1E+00	2.9E+00	1.6E+00	6.5E-01
	2.8E-01	1.4E-01	5.1E-02			
0400 342	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	8.9E-01	3.1E+00	2.5E+00	2.7E+00	3.2E+00	3.9E+00
	3.6E+00	3.2E+00	2.1E+00	1.3E+00	8.0E-01	4.6E-01
	2.5E-01	1.5E-01	9.2E-02			
0401 392	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.2E-01	3.0E+00	2.5E+00	3.1E+00	3.5E+00	4.4E+00
	3.5E+00	3.4E+00	2.2E+00	1.3E+00	7.7E-01	4.8E-01
	2.5E-01	2.1E-01	1.2E-01			
0402 386	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	5.1E-01	3.1E+00	2.8E+00	3.6E+00	4.3E+00	4.8E+00
	3.9E+00	3.5E+00	2.3E+00	1.4E+00	8.9E-01	5.2E-01
	2.7E-01	1.6E-01	9.8E-02			

0415 454	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	[illegible]	3.4E+00	2.9E+00	2.8E+00	2.9E+00	3.2E+00
	[illegible]	2.4E+00	1.5E+00	9.3E-01	5.1E-01	2.6E-01
	[illegible]	1.1E-01	7.1E-02			
0416 467	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.0E+00	3.1E+00	2.7E+00	2.7E+00	2.8E+00	[illegible]
	2.5E+00	2.2E+00	1.3E+00	7.6E-01	4.1E-01	2.1E-01
	1.8E-01	1.0E-01	7.5E-02			
0417 489	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	3.0E+00	2.6E+00	2.8E+00	2.6E+00	2.9E+00
	2.3E+00	2.0E+00	1.2E+00	7.1E-01	3.7E-01	1.9E-01
	1.4E-01	9.9E-02	5.7E-02			
0430 501	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.9E+00	4.3E+00	1.6E+00	1.4E+00	1.6E+00	1.7E+00
	1.4E+00	1.3E+00	9.2E-01	6.4E-01	4.1E-01	2.4E-01
	1.6E-01	1.0E-01	5.3E-02			
0431 517	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.0E+00	3.7E+00	1.6E+00	1.4E+00	1.6E+00	1.9E+00
	1.4E+00	1.3E+00	1.0E+00	7.4E-01	4.6E-01	2.3E-01
	1.7E-01	9.1E-02	6.1E-02			
0432 489	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.5E+00	4.7E+00	1.8E+00	1.4E+00	1.5E+00	1.6E+00
	1.3E+00	1.2E+00	1.0E+00	7.2E-01	4.3E-01	2.7E-01
	1.5E-01	1.1E-01	7.1E-02			
0445 479	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	5.7E+00	1.8E+00	1.4E+00	1.6E+00	1.7E+00
	1.5E+00	1.5E+00	1.0E+00	8.0E-01	5.1E-01	3.0E-01
	1.7E-01	1.1E-01	6.3E-02			
0446 501	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.6E+00	5.7E+00	1.9E+00	1.6E+00	1.6E+00	1.9E+00
	1.5E+00	1.5E+00	1.1E+00	6.7E-01	4.9E-01	2.6E-01
	1.6E-01	1.1E-01	7.1E-02			
0447 516	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.9E+00	6.1E+00	1.8E+00	1.8E+00	1.7E+00	1.7E+00
	1.5E+00	1.5E+00	1.1E+00	8.4E-01	5.4E-01	3.3E-01
	1.8E-01	1.1E-01	7.6E-02			
0500 406	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.7E+00	4.9E+00	1.2E+00	1.6E+00	1.7E+00	2.0E+00
	1.8E+00	2.0E+00	1.6E+00	1.1E+00	6.1E-01	3.4E-01
	2.0E-01	4.7E-02	3.1E-02			
0501 464	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.1E+00	4.6E+00	2.2E+00	1.9E+00	1.8E+00	2.0E+00
	1.9E+00	2.0E+00	1.6E+00	1.2E+00	8.0E-01	4.3E-01
	2.7E-01	1.2E-01	4.7E-02			
0502 419	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.4E+00	4.9E+00	2.2E+00	1.8E+00	1.8E+00	1.9E+00
	1.8E+00	1.9E+00	1.6E+00	1.1E+00	8.0E-01	4.5E-01
	2.1E-01	1.1E-01	6.3E-02			

0507 411	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	1.4E+00	4.5E+00	2.5E+00	2.1E+00	1.8E+00	1.9E+00
	2.0E+00	1.9E+00	1.4E+00	1.2E+00	7.0E-01	4.1E-01
	2.0E-01	8.3E-02	5.3E-02			
0508 4[illegible]	[illegible]	[illegible]	0.0E-01	0.0E-01	0.0E-01	0.0E-01
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.8E+00	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	7.1E-02	[illegible]			
0509 418	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	4.6E+00	2.2E+00	2.1E+00	2.2E+00	2.6E+00
	2.3E+00	2.3E+00	1.5E+00	1.0E+00	5.3E-01	2.7E-01
	1.5E-01	7.5E-02	3.5E-02			
0510 389	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.8E+00	4.7E+00	2.2E+00	2.3E+00	2.7E+00	2.9E+00
	2.6E+00	2.3E+00	1.7E+00	1.1E+00	5.7E-01	2.3E-01
	1.0E-01	5.7E-02	2.4E-02			
0511 352	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	5.0E+00	1.9E+00	2.1E+00	2.4E+00	2.8E+00
	2.6E+00	2.6E+00	1.8E+00	9.1E-01	4.3E-01	2.2E-01
	9.5E-02	7.5E-02	6.1E-02			
0512 509	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.0E+00	4.5E+00	1.9E+00	1.6E+00	1.6E+00	1.7E+00
	1.3E+00	1.1E+00	6.7E-01	2.8E-01	9.1E-02	2.0E-02
	1.0E-02	6.1E-03	0.0E-01			
0513 495	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	5.6E+00	2.6E+00	1.7E+00	1.7E+00	1.4E+00
	1.2E+00	1.0E+00	5.9E-01	2.8E-01	1.0E-01	3.2E-02
	1.4E-02	0.0E-01	0.0E-01			
0514 527	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	4.7E+00	1.7E+00	1.7E+00	1.5E+00	1.6E+00
	1.2E+00	1.0E+00	4.6E-01	2.4E-01	7.1E-02	1.4E-02
	4.1E-03	2.0E-03	2.0E-03			
0515 491	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.5E+00	6.0E+00	2.2E+00	1.6E+00	1.6E+00	1.5E+00
	1.2E+00	1.0E+00	6.5E-01	3.7E-01	1.3E-01	3.6E-02
	2.2E-02	0.0E-01	0.0E-01			
0516 550	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.6E+00	6.3E+00	2.3E+00	1.6E+00	1.7E+00	1.6E+00
	1.2E+00	1.2E+00	6.8E-01	4.1E-01	1.3E-01	8.1E-02
	3.2E-02	2.0E-03	2.0E-03			
0517 517	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.3E+00	8.4E+00	2.5E+00	1.7E+00	1.6E+00	1.5E+00
	1.2E+00	1.1E+00	8.5E-01	4.6E-01	2.7E-01	1.1E-01
	3.9E-02	1.6E-02	2.0E-03			
0518 499	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	3.1E+00	8.0E+00	2.3E+00	1.7E+00	1.5E+00	1.5E+00
	1.2E+00	1.1E+00	7.1E-01	3.7E-01	1.9E-01	6.3E-02
	2.4E-02	8.1E-03	0.0E-01			
0519 535	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.5E+00	6.0E+00	1.9E+00	1.3E+00	1.4E+00	1.3E+00
	9.7E-01	9.1E-01	5.6E-01	2.9E-01	1.1E-01	3.2E-02
	1.0E-02	4.1E-03	2.0E-03			
0520 537	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	2.2E+00	5.5E+00	1.8E+00	1.4E+00	1.3E+00	1.4E+00
	1.2E+00	1.0E+00	5.1E-01	2.8E-01	9.1E-02	2.6E-02
	6.1E-03	2.0E-03	0.0E-01			

Fog 11A. August 8 (Day 220) 1975

DAY 220 NUMBER DENSITY (NO./CC/MICRON)
HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

1815 9999	2.8E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.3E-02	1.0E-01	3.6E-02	5.9E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1816 9999	0.0E-01	1.3E-02	4.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 1	7.1E-02	1.0E-01	2.8E-02	1.6E-02	3.9E-03	6.1E-03
	4.1E-03	0.0E-01	0.0E-01	2.0E-03	0.0E-01	2.0E-03
	0.0E-01	2.0E-03	3.9E-03			
1817 9999	1.4E-03	1.5E-04	9.9E-05	0.0E-01	7.0E-05	0.0E-01
ASSP 1	7.9E-02	8.4E-02	3.6E-02	7.8E-03	7.8E-03	6.1E-03
	0.0E-01	2.2E-03	4.1E-03	2.0E-03	6.1E-03	0.0E-01
	0.0E-01	1.0E-02	9.8E-03			
1830 9873	1.4E-02	1.6E-04	5.3E-05	6.9E-05	0.0E-01	0.0E-01
ASSP 1	5.6E-02	6.7E-02	2.8E-02	9.8E-03	5.9E-03	4.1E-03
	4.1E-03	1.3E-02	1.0E-02	8.1E-03	8.1E-03	6.1E-03
	6.1E-03	6.1E-03	0.0E-01			
1831 9848	5.1E-03	0.0E-01	3.7E-05	0.0E-01	2.6E-05	1.9E-05
ASSP 1	6.6E-02	1.2E-01	4.5E-02	2.5E-02	2.4E-02	2.0E-02
	1.6E-02	1.1E-02	1.8E-02	4.1E-03	8.1E-03	1.2E-02
	8.1E-03	6.1E-03	7.8E-03			
1832 7879	6.7E-04	2.2E-04	2.4E-05	0.0E-01	8.6E-06	6.3E-06
ASSP 1	7.1E-02	1.6E-01	2.6E-02	3.5E-02	2.0E-02	2.2E-02
	1.6E-02	1.7E-02	1.4E-02	8.1E-03	1.8E-02	1.4E-02
	1.2E-02	8.1E-03	2.0E-02			
1845 7544	4.3E-03	3.5E-04	0.0E-01	2.0E-05	1.4E-05	0.0E-01
ASSP 1	9.9E-02	2.1E-01	2.8E-02	3.7E-02	2.7E-02	6.1E-03
	8.1E-03	1.1E-02	1.6E-02	6.1E-03	2.0E-03	1.2E-02
	4.1E-03	6.1E-03	5.9E-03			
1846 7169	5.4E-03	8.2E-04	0.0E-01	8.1E-05	4.1E-05	2.0E-05
ASSP 1	5.6E-02	1.6E-01	6.9E-02	2.2E-02	2.0E-02	1.6E-02
	1.2E-02	1.5E-02	1.4E-02	1.4E-02	8.1E-03	1.4E-02
	8.1E-03	2.0E-02	3.9E-03			
1847 9091	3.5E-03	1.5E-04	2.5E-05	1.3E-05	2.6E-05	0.0E-01
ASSP 1	5.8E-02	1.8E-01	5.3E-02	2.2E-02	2.7E-02	3.6E-02
	2.4E-02	2.8E-02	2.4E-02	2.8E-02	1.2E-02	1.6E-02
	2.4E-02	2.4E-02	9.8E-03			

1901 [illegible]	[illegible]	[illegible]	2.7E-04	1.6E-04	4.1E-05	4.0E-05
ASSP 1	[illegible]	2.4E-01	1.3E-01	1.3E-01	1.1E-01	1.6E-01
	[illegible]	1.3E-01	1.3E-01	1.5E-01	1.3E-01	9.5E-02
	[illegible]	1.1E-01	[illegible]			
1902 [illegible]	1.4E-03	1.3E-04	2.6E-05	3.2E-05	2.4E-05	1.3E-05
ASSP 1	7.6E-02	2.7E-01	1.3E-01	1.1E-01	9.4E-02	1.0E-01
	9.1E-02	1.1E-01	8.7E-02	1.1E-01	6.7E-02	5.9E-02
	7.9E-02	5.1E-02	6.5E-02			
1903 2138	1.2E-02	4.2E-03	2.1E-03	1.1E-03	7.5E-04	8.3E-04
ASSP 1	5.8E-02	2.8E-01	1.7E-01	1.6E-01	2.1E-01	2.9E-01
	2.8E-01	2.6E-01	2.8E-01	2.5E-01	2.1E-01	1.9E-01
	1.5E-01	1.2E-01	1.5E-01			
1904 2561	1.9E-01	6.0E-02	1.0E-02	8.4E-03	3.6E-03	3.5E-03
ASSP 1	4.8E-02	3.0E-01	1.7E-01	1.3E-01	1.9E-01	2.9E-01
	2.3E-01	2.8E-01	2.3E-01	2.5E-01	2.1E-01	2.0E-01
	1.7E-01	1.5E-01	1.6E-01			
1905 3052	2.2E-03	6.0E-04	6.9E-05	5.7E-05	4.5E-05	2.0E-05
ASSP 1	3.3E-02	3.2E-01	2.3E-01	3.7E-01	3.4E-01	4.1E-01
	3.5E-01	3.8E-01	3.1E-01	3.1E-01	2.7E-01	2.2E-01
	1.8E-01	1.6E-01	1.1E-01			
1906 2635	1.7E-02	6.2E-04	1.8E-04	5.5E-05	3.1E-05	4.6E-06
ASSP 1	8.4E-02	3.1E-01	2.9E-01	4.4E-01	4.7E-01	5.2E-01
	4.9E-01	5.1E-01	4.6E-01	4.1E-01	2.9E-01	2.3E-01
	2.1E-01	1.4E-01	1.1E-01			
1907 3504	9.7E-01	1.7E-02	2.5E-03	2.3E-04	1.0E-04	8.8E-05
ASSP 1	1.0E-01	4.7E-01	3.7E-01	3.6E-01	3.7E-01	4.5E-01
	4.8E-01	5.2E-01	4.0E-01	4.1E-01	3.1E-01	2.8E-01
	1.9E-01	1.6E-01	9.8E-02			
1908 2029	8.3E+01	6.2E-01	1.4E-01	9.7E-03	6.9E-03	4.8E-03
ASSP 1	1.0E-01	2.7E-01	2.3E-01	2.7E-01	3.9E-01	5.0E-01
	4.7E-01	5.4E-01	4.7E-01	4.1E-01	3.4E-01	2.5E-01
	2.4E-01	1.3E-01	1.2E-01			
1909 1323	1.5E+00	2.7E-02	3.7E-03	5.6E-04	3.0E-04	2.2E-04
ASSP 1	6.6E-02	6.0E-01	6.1E-01	5.8E-01	5.4E-01	6.8E-01
	6.1E-01	5.4E-01	5.0E-01	4.6E-01	4.2E-01	3.0E-01
	3.1E-01	2.4E-01	1.8E-01			
1910 1782	4.3E+00	3.0E-02	4.1E-03	5.5E-04	4.5E-04	2.4E-[illegible]
ASSP 1	9.4E-02	5.1E-01	6.0E-01	6.2E-01	5.1E-01	5.2E-01
	5.2E-01	5.1E-01	4.4E-01	3.1E-01	2.7E-01	2.1E-01
	2.0E-01	1.9E-01	1.8E-01			
1911 2658	1.7E+00	3.1E-02	4.3E-03	6.8E-04	4.1E-04	2.3E-04
ASSP 1	8.4E-02	4.3E-01	5.7E-01	6.3E-01	6.3E-01	6.2E-01
	5.6E-01	4.9E-01	3.6E-01	3.1E-01	2.4E-01	1.7E-01
	1.4E-01	1.1E-01	8.2E-02			
1912 2590	2.5E+01	2.2E-01	2.1E-02	4.4E-03	2.6E-03	1.4E-03
ASSP 1	1.1E-01	3.2E-01	3.9E-01	3.9E-01	3.3E-01	3.2E-01
	3.1E-01	2.8E-01	2.2E-01	2.0E-01	1.5E-01	1.2E-01
	1.2E-01	6.3E-02	6.7E-02			
1913 1960	1.7E-01	2.3E-02	6.5E-03	1.6E-03	1.6E-03	7.8E-04
ASSP 1	4.9E-02	2.2E-01	4.4E-01	6.8E-01	8.2E-01	9.3E-01
	7.8E-01	6.9E-01	5.6E-01	3.8E-01	3.4E-01	2.1E-01
	1.7E-01	1.3E-01	7.8E-02			
1914 2073	4.5E-03	7.2E-04	1.6E-04	9.0E-05	4.2E-05	2.8E-05
ASSP 1	0.0E-01	6.3E-03	9.9E-02	3.2E-01	5.6E-01	7.5E-01
	5.7E-01	4.9E-01	4.0E-01	3.2E-01	2.6E-01	2.0E-01
	1.7E-01	1.1E-01	9.4E-02			

1915 1357	6.2E-02	1.6E-03	3.3E-04	1.0E-04	7.5E-05	1.6E-05
ASSP 1	0.0E-01	2.7E-02	2.8E-01	6.1E-01	1.0E+00	1.4E+00
	1.3E+00	1.2E+00	9.7E-01	7.5E-01	5.6E-01	3.3E-01
	2.7E-01	2.0E-01	1.3E-01			
1916 1309	6.1E-02	1.4E-02	5.7E-03	1.4E-04	2.9E-04	1.4E-04
ASSP 1	0.0E-01	6.3E-02	3.7E-01	4.4E-01	6.4E-01	7.3E-01
	7.1E-01	6.9E-01	4.8E-01	3.9E-01	2.7E-01	2.0E-01
	1.5E-01	7.1E-02	7.3E-02			
1917 1303	1.5E-01	5.0E-02	1.7E-02	2.0E-03	2.9E-04	7.1E-05
ASSP 1	0.0E-01	1.3E-02	3.3E-01	7.1E-01	1.3E+00	1.9E+00
	1.8E+00	1.7E+00	1.4E+00	9.5E-01	7.8E-01	5.2E-01
	3.5E-01	1.8E-01	1.1E-01			
1918 3585	3.1E-02	1.7E-02	4.4E-03	2.9E-04	1.9E-04	7.1E-05
ASSP 1	0.0E-01	4.2E-03	1.3E-01	3.1E-01	5.0E-01	6.2E-01
	6.0E-01	5.8E-01	4.7E-01	3.5E-01	2.3E-01	1.7E-01
	1.4E-01	9.9E-02	4.3E-02			
1919 2471	5.4E-02	1.2E-02	2.2E-03	2.9E-04	2.9E-04	2.1E-04
ASSP 1	5.1E-03	1.0E-02	2.0E-01	4.6E-01	6.0E-01	6.6E-01
	5.2E-01	5.0E-01	3.4E-01	2.7E-01	1.9E-01	1.3E-01
	1.2E-01	8.1E-02	5.3E-02			
1920 1466	8.4E-02	2.1E-02	7.1E-03	2.9E-03	1.3E-03	1.2E-02
ASSP 1	0.0E-01	5.5E-02	4.9E-01	9.3E-01	1.4E+00	1.6E+00
	1.3E+00	1.2E+00	8.7E-01	6.4E-01	4.5E-01	3.4E-01
	2.2E-01	1.7E-01	1.4E-01			
1921 1100	1.5E-01	4.0E-02	1.2E-02	2.6E-03	8.8E-04	5.0E-04
ASSP 1	2.5E-03	2.5E-02	3.6E-01	1.3E+00	2.0E+00	2.3E+00
	1.9E+00	1.6E+00	1.1E+00	8.2E-01	5.5E-01	3.6E-01
	2.4E-01	2.2E-01	1.2E-01			
1922 1478	9.2E-02	2.9E-02	9.8E-03	1.6E-03	5.8E-04	7.2E-05
ASSP 1	5.1E-03	4.0E-02	4.2E-01	1.1E+00	1.8E+00	2.0E+00
	1.6E+00	1.5E+00	1.0E+00	7.3E-01	5.0E-01	2.6E-01
	1.9E-01	1.4E-01	1.0E-01			
1923 1297	1.2E-01	3.4E-02	7.4E-03	2.3E-03	7.8E-04	2.9E-04
ASSP 1	0.0E-01	2.3E-02	2.7E-01	7.3E-01	1.3E+00	1.8E+00
	1.5E+00	1.4E+00	1.0E+00	7.0E-01	4.8E-01	3.3E-01
	2.3E-01	1.6E-01	1.1E-01			
1924 1801	9.2E-02	2.8E-02	8.2E-03	2.0E-03	8.8E-04	5.7E-04
ASSP 1	0.0E-01	1.7E-02	2.4E-01	5.1E-01	9.5E-01	1.3E+00
	1.2E+00	1.2E+00	7.6E-01	6.5E-01	4.0E-01	3.0E-01
	1.9E-01	1.5E-01	9.6E-02			
1925 990	1.5E-01	4.0E-02	1.1E-02	3.2E-03	7.9E-04	2.2E-04
ASSP 1	5.1E-03	8.8E-02	4.9E-01	9.6E-01	1.5E+00	2.1E+00
	1.7E+00	1.6E+00	1.2E+00	8.6E-01	6.6E-01	3.6E-01
	2.0E-01	1.4E-01	8.4E-02			
1926 861	2.0E-01	4.4E-02	1.6E-02	2.4E-03	8.0E-04	5.1E-04
ASSP 1	1.0E-02	1.3E-01	6.3E-01	1.2E+00	2.0E+00	2.9E+00
	2.3E+00	2.1E+00	1.6E+00	.9.7E-01	7.4E-01	4.3E-01
	3.2E-01	2.2E-01	1.1E-01			
1927 1210	4.9E-03	2.1E-03	5.1E-04	7.4E-05	2.5E-05	2.3E-05
ASSP 1	1.3E-02	2.2E-01	6.4E-01	9.5E-01	1.4E+00	1.6E+00
	1.3E+00	9.9E-01	8.3E-01	5.2E-01	3.5E-01	2.6E-01
	1.5E-01	9.5E-02	7.8E-02			

1928 1250	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	7.6E-03	1.3E-01	5.3E-01	7.7E-01	1.3E+00	1.4E+00
	1.2E+00	9.4E-01	6.5E-01	5.8E-01	3.4E-01	2.7E-01
	1.7E-01	1.8E-01	1.1E-01			
1929 1054	4.3E-03	1.0E-03	4.7E-04	1.2E-04	5.0E-05	3.0E-05
ASSP 1	0.0E-01	1.1E-01	4.2E-01	7.8E-01	1.1E+00	1.2E+00
	1.1E+00	8.5E-01	7.1E-01	4.6E-01	3.7E-01	2.8E-01
	2.0E-01	1.7E-01	1.1E-01			
1930 721	8.1E-03	2.8E-03	1.0E-03	1.4E-04	8.2E-05	7.2E-05
ASSP 1	0.0E-01	6.7E-02	4.9E-01	1.3E+00	2.3E+00	3.0E+00
	2.5E+00	2.1E+00	1.6E+00	1.0E+00	7.0E-01	4.8E-01
	2.9E-01	2.1E-01	1.5E-01			
1931 666	8.0E-03	2.8E-03	9.9E-04	1.6E-04	3.9E-05	1.8E-05
ASSP 1	7.6E-03	2.1E-02	3.8E-01	1.2E+00	2.4E+00	3.2E+00
	2.7E+00	2.6E+00	2.0E+00	1.4E+00	1.1E+00	6.6E-01
	4.5E-01	2.7E-01	1.5E-01			
1932 853	6.4E-03	3.0E-03	1.1E-03	1.7E-04	2.5E-05	2.6E-05
ASSP 1	5.1E-03	3.1E-02	4.5E-01	1.1E+00	2.0E+00	2.9E+00
	2.5E+00	2.1E+00	1.7E+00	1.2E+00	8.8E-01	5.9E-01
	4.1E-01	2.2E-01	1.5E-01			
1933 716	5.9E-03	2.4E-03	6.1E-04	1.7E-04	6.7E-05	3.5E-05
ASSP 1	5.1E-03	9.2E-02	4.4E-01	1.1E+00	2.0E+00	2.8E+00
	2.3E+00	2.2E+00	1.7E+00	1.3E+00	8.1E-01	6.1E-01
	3.8E-01	2.4E-01	1.7E-01			
1934 900	3.3E-03	2.4E-03	5.4E-04	1.5E-04	9.8E-05	2.8E-05
ASSP 1	2.3E-02	2.3E-01	5.1E-01	1.1E+00	1.9E+00	2.3E+00
	2.2E+00	1.8E+00	1.4E+00	8.8E-01	7.3E-01	5.0E-01
	3.5E-01	2.5E-01	1.6E-01			
1935 731	4.8E-03	1.8E-03	4.7E-04	1.4E-04	8.8E-05	3.4E-05
ASSP 1	1.5E-02	2.1E-01	4.4E-01	1.1E+00	1.9E+00	2.4E+00
	2.0E+00	1.8E+00	1.4E+00	8.9E-01	7.5E-01	5.0E-01
	3.2E-01	2.6E-01	1.6E-01			
1936 947	7.0E-03	1.5E-03	5.4E-04	1.2E-04	7.0E-05	6.9E-05
ASSP 1	1.8E-02	3.6E-01	6.4E-01	1.0E+00	1.4E+00	2.0E+00
	1.7E+00	1.5E+00	1.1E+00	8.7E-01	6.3E-01	5.3E-01
	3.4E-01	2.7E-01	1.5E-01			
1937 710	6.8E-03	1.9E-03	7.4E-04	1.6E-04	9.1E-05	4.7E-05
ASSP 1	1.3E-02	1.8E-01	8.8E-01	1.5E+00	2.0E+00	2.6E+00
	2.2E+00	2.0E+00	1.4E+00	1.1E+00	7.7E-01	5.7E-01
	4.2E-01	2.7E-01	2.4E-01			
1938 704	7.2E-03	2.0E-03	5.8E-04	2.7E-04	1.0E-04	4.2E-05
ASSP 1	1.3E-02	1.5E-01	5.9E-01	1.1E+00	1.9E+00	2.6E+00
	2.2E+00	2.1E+00	1.7E+00	1.3E+00	1.0E+00	7.1E-01
	5.0E-01	3.7E-01	2.4E-01			
1939 747	6.8E-03	1.7E-03	7.3E-04	1.2E-04	4.0E-05	2.4E-05
ASSP 1	2.0E-02	3.4E-01	7.1E-01	1.3E+00	2.1E+00	2.7E+00
	2.4E+00	2.2E+00	1.7E+00	1.3E+00	1.0E+00	6.9E-01
	4.5E-01	3.2E-01	1.9E-01			
1940 809	4.5E-03	1.7E-03	5.2E-04	1.8E-04	6.1E-05	3.1E-05
ASSP 1	2.0E-02	1.9E-01	6.6E-01	1.4E+00	2.0E+00	2.4E+00
	1.9E+00	1.8E+00	1.4E+00	1.0E+00	8.3E-01	5.4E-01
	4.1E-01	3.0E-01	1.8E-01			

1941 852	1.1E-02	1.9E-03	9.0E-04	2.1E-04	1.0E-04	4.8E-05
ASSP 1	1.8E-02	1.7E-01	4.7E-01	1.3E+00	1.8E+00	2.3E+00
	2.0E+00	1.9E+00	1.6E+00	1.2E+00	9.9E-01	7.1E-01
	5.3E-01	3.6E-01	2.6E-01			
1942 656	9.8E-03	2.5E-03	1.2E-03	2.7E-04	1.5E-04	8.3E-05
ASSP 1	2.5E-03	7.3E-02	8.6E-01	1.5E+00	1.9E+00	2.3E+00
	1.8E+00	1.9E+00	1.6E+00	1.1E+00	1.0E+00	7.9E-01
	5.3E-01	3.6E-01	2.5E-01			
1943 625	1.6E-02	4.0E-03	1.7E-03	4.0E-04	2.1E-04	5.1E-05
ASSP 1	0.0E-01	2.4E-02	3.4E-01	8.0E-01	1.6E+00	2.4E+00
	2.4E+00	2.5E+00	2.2E+00	1.6E+00	1.3E+00	1.0E+00
	6.4E-01	5.0E-01	2.7E-01			
1944 627	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	5.1E-03	3.8E-02	3.4E-01	8.8E-01	1.7E+00	2.5E+00
	2.3E+00	2.2E+00	2.0E+00	1.5E+00	1.2E+00	8.1E-01
	5.3E-01	3.7E-01	1.9E-01			
1945 792	3.9E-03	3.0E-03	1.1E-03	1.0E-04	3.1E-05	0.0E-01
ASSP 1	2.5E-03	6.3E-02	5.3E-01	1.3E+00	2.5E+00	2.9E+00
	2.5E+00	2.4E+00	1.9E+00	1.3E+00	8.7E-01	5.9E-01
	3.3E-01	2.0E-01	8.2E-02			
1946 720	5.1E-03	2.1E-03	6.4E-04	1.3E-04	3.3E-05	8.0E-06
ASSP 1	2.5E-03	2.1E-02	6.4E-01	1.4E+00	2.3E+00	2.7E+00
	2.3E+00	2.1E+00	1.7E+00	1.2E+00	8.5E-01	5.7E-01
	3.2E-01	2.1E-01	1.1E-01			
1947 781	7.8E-03	1.9E-03	5.9E-04	8.3E-05	2.2E-05	3.2E-06
ASSP 1	1.8E-02	9.0E-02	8.5E-01	1.8E+00	2.7E+00	3.0E+00
	2.5E+00	2.3E+00	1.8E+00	1.2E+00	8.6E-01	5.1E-01
	2.9E-01	1.9E-01	1.1E-01			
1948 713	9.8E-03	4.0E-03	1.3E-03	2.1E-04	4.8E-05	1.2E-05
ASSP 1	2.5E-03	7.3E-02	8.7E-01	2.2E+00	3.1E+00	3.3E+00
	2.7E+00	2.4E+00	1.6E+00	1.1E+00	7.8E-01	4.6E-01
	2.8E-01	1.6E-01	1.0E-01			
1949 581	6.8E-02	1.9E-02	5.6E-03	1.0E-03	2.6E-04	2.2E-04
ASSP 1	1.5E-02	1.0E-01	9.8E-01	2.2E+00	3.4E+00	3.8E+00
	2.9E+00	2.5E+00	1.6E+00	1.2E+00	7.0E-01	5.1E-01
	3.1E-01	2.0E-01	1.5E-01			
1950 731	5.7E-02	2.6E-02	9.9E-03	2.2E-03	1.2E-03	4.8E-04
ASSP 1	1.0E-02	1.7E-01	1.1E+00	2.4E+00	3.2E+00	3.5E+00
	2.5E+00	2.1E+00	1.5E+00	8.7E-01	6.1E-01	4.6E-01
	2.9E-01	2.0E-01	1.6E-01			
1951 732	2.0E-02	6.5E-03	2.2E-03	4.4E-04	2.7E-04	1.1E-04
ASSP 1	7.6E-03	4.8E-02	8.7E-01	2.1E+00	3.1E+00	3.3E+00
	2.7E+00	2.1E+00	1.5E+00	1.1E+00	7.5E-01	6.3E-01
	3.8E-01	2.5E-01	1.9E-01			
1952 719	1.3E-02	4.1E-03	1.6E-03	4.0E-04	1.3E-04	6.8E-05
ASSP 1	0.0E-01	2.7E-02	7.9E-01	1.8E+00	2.7E+00	3.0E+00
	2.4E+00	2.2E+00	1.7E+00	1.1E+00	8.8E-01	5.7E-01
	3.9E-01	3.1E-01	2.1E-01			
1953 946	1.4E-02	5.6E-03	1.7E-03	3.7E-04	2.7E-04	1.9E-04
ASSP 1	2.5E-03	3.6E-02	7.4E-01	1.3E+00	2.0E+00	2.2E+00
	1.8E+00	1.5E+00	1.1E+00	7.4E-01	6.0E-01	4.4E-01
	2.3E-01	2.2E-01	1.5E-01			

1954 725	1.6E-02	3.8E-03	1.1E-03	6.0E-04	2.9E-04	1.1E-04
ASSP 1	2.0E-02	6.1E-01	1.3E+00	1.6E+00	1.7E+00	1.8E+00
	1.4E+00	1.2E+00	4.9E-01	7.2E-01	5.2E-01	3.5E-01
	2.4E-01	2.2E-01	1.4E-01			
1955 950	2.2E-02	6.2E-03	1.6E-03	2.0E-04	1.2E-04	5.0E-05
ASSP 1	2.5E-02	4.0E-01	1.0E+00	1.5E+00	1.9E+00	2.0E+00
	1.4E+00	1.3E+00	1.0E+00	6.7E-01	4.4E-01	3.9E-01
	2.5E-01	1.5E-01	1.2E-01			
1956 782	7.4E-02	1.5E-02	3.7E-03	9.4E-04	3.4E-04	2.2E-04
ASSP 1	6.1E-02	5.4E-01	1.6E+00	1.7E+00	1.8E+00	1.9E+00
	1.5E+00	1.3E+00	8.7E-01	7.7E-01	5.0E-01	3.8E-01
	2.8E-01	2.0E-01	1.4E-01			
1957 968	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	1.3E-02	3.7E-01	1.2E+00	1.7E+00	2.1E+00	2.0E+00
	1.5E+00	1.2E+00	8.1E-01	5.7E-01	4.2E-01	2.6E-01
	2.0E-01	1.4E-01	9.6E-02			
1958 860	4.9E-02	9.6E-03	1.9E-03	7.5E-04	6.0E-04	2.6E-04
ASSP 1	2.5E-02	1.2E-01	8.2E-01	1.3E+00	1.7E+00	1.8E+00
	1.4E+00	1.2E+00	9.1E-01	6.7E-01	5.9E-01	3.8E-01
	3.0E-01	2.2E-01	1.8E-01			
1959 883	2.3E-02	4.9E-03	1.3E-03	2.8E-04	1.7E-04	9.2E-05
ASSP 1	1.5E-02	1.6E-01	9.4E-01	1.5E+00	1.8E+00	1.7E+00
	1.2E+00	1.1E+00	7.8E-01	6.0E-01	4.7E-01	3.2E-01
	2.4E-01	1.6E-01	1.7E-01			
2000 706	1.0E-02	3.9E-03	6.4E-04	1.2E-04	5.4E-05	2.8E-05
ASSP 3	2.4E+00	4.3E+00	4.1E+00	2.9E+00	3.6E+00	3.5E+00
	3.0E+00	2.6E+00	2.6E+00	2.0E+00	1.4E+00	1.3E+00
	1.0E+00	8.0E-01	6.1E-01			
2001 1298	1.1E-02	3.1E-03	6.8E-04	1.0E-04	2.7E-05	2.3E-05
ASSP 3	4.2E-01	2.6E+00	3.1E+00	2.7E+00	4.1E+00	4.5E+00
	4.1E+00	3.8E+00	3.3E+00	2.6E+00	2.0E+00	1.6E+00
	1.3E+00	8.9E-01	6.9E-01			
2002 1463	1.3E-02	3.1E-03	7.4E-04	1.3E-04	3.1E-05	1.8E-05
ASSP 3	2.9E-01	1.0E+00	2.3E+00	2.6E+00	4.4E+00	5.2E+00
	4.4E+00	4.0E+00	3.1E+00	2.5E+00	1.9E+00	1.4E+00
	1.0E+00	7.7E-01	4.8E-01			
2003 943	1.2E-02	3.7E-03	4.9E-04	2.3E-04	2.1E-05	5.3E-05
ASSP 3	3.3E-01	7.7E-01	2.1E+00	2.6E+00	4.1E+00	3.8E+00
	2.9E+00	2.4E+00	2.0E+00	1.3E+00	1.0E+00	7.1E-01
	5.9E-01	4.6E-01	3.0E-01			
2004 867	5.2E-02	1.2E-02	1.7E-03	1.8E-04	4.2E-04	3.5E-04
ASSP 3	5.2E+00	4.6E+00	3.8E+00	2.6E+00	3.3E+00	2.9E+00
	2.5E+00	1.9E+00	1.6E+00	1.1E+00	8.5E-01	6.7E-01
	4.9E-01	2.9E-01	2.4E-01			
2005 950	1.3E-02	2.8E-03	7.1E-04	1.4E-04	9.7E-05	7.1E-05
ASSP 3	8.1E-01	3.7E+00	4.4E+00	3.4E+00	4.2E+00	4.1E+00
	3.2E+00	2.8E+00	2.3E+00	1.8E+00	1.3E+00	9.4E-01
	7.6E-01	6.1E-01	4.4E-01			
2006 861	1.3E-02	4.3E-03	8.0E-04	1.5E-04	6.1E-05	5.1E-05
ASSP 3	7.5E-01	4.1E+00	4.1E+00	3.2E+00	4.3E+00	4.3E+00
	3.7E+00	3.4E+00	2.7E+00	2.0E+00	1.4E+00	1.0E+00
	8.8E-01	6.3E-01	4.0E-01			

2007 878	8.6E-03	1.8E-03	3.1E-04	4.7E-05	1.8E-05	2.3E-05
ASSP 3	4.6E-02	8.5E-01	1.8E+00	3.7E+00	5.6E+00	5.6E+00
	4.8E+00	4.0E+00	3.3E+00	2.4E+00	1.7E+00	1.1E+00
	7.9E-01	4.6E-01	4.0E-01			
2008 1525	2.5E-02	7.2E-03	1.2E-03	1.2E-04	2.6E-05	2.9E-05
ASSP 3	1.8E-01	2.0E+00	2.8E+00	4.0E+00	5.9E+00	5.9E+00
	4.9E+00	4.2E+00	3.3E+00	2.4E+00	1.6E+00	1.0E+00
	6.8E-01	4.5E-01	3.0E-01			
2009 844	2.5E-02	6.7E-03	1.5E-03	1.4E-04	1.9E-05	5.5E-05
ASSP 3	2.2E-01	1.2E+00	1.9E+00	2.7E+00	3.9E+00	4.1E+00
	3.6E+00	3.1E+00	2.3E+00	1.6E+00	1.2E+00	7.9E-01
	5.6E-01	4.2E-01	2.7E-01			
2010 655	6.9E-03	1.7E-03	3.0E-04	1.9E-05	3.2E-06	4.6E-06
ASSP 3	2.5E-01	9.9E-01	1.7E+00	3.0E+00	5.0E+00	5.6E+00
	4.9E+00	4.2E+00	3.7E+00	2.8E+00	2.0E+00	1.5E+00
	1.0E+00	6.7E-01	4.6E-01			
2011 819	3.7E-02	1.1E-02	2.5E-03	1.9E-04	1.5E-04	1.4E-05
ASSP 3	4.5E-01	4.2E+00	5.3E+00	4.4E+00	5.4E+00	5.0E+00
	4.3E+00	4.0E+00	3.4E+00	2.5E+00	1.8E+00	1.3E+00
	9.4E-01	7.3E-01	5.0E-01			
2012 599	6.6E-03	1.8E-03	4.7E-04	2.2E-05	0.0E-01	2.8E-06
ASSP 3	5.0E-01	4.7E+00	5.1E+00	4.2E+00	5.0E+00	4.2E+00
	3.6E+00	3.5E+00	2.8E+00	2.1E+00	1.6E+00	1.2E+00
	6.7E-01	5.6E-01	4.3E-01			
2013 1699	1.6E-02	2.2E-03	4.7E-04	2.7E-05	2.3E-05	6.8E-06
ASSP 3	1.1E+00	5.5E+00	7.8E+00	6.1E+00	7.6E+00	5.6E+00
	4.0E+00	3.0E+00	2.4E+00	1.6E+00	1.1E+00	7.3E-01
	5.1E-01	4.0E-01	2.1E-01			
2014 3801	9.1E-03	2.2E-03	2.9E-04	2.7E-05	6.1E-06	4.5E-06
ASSP 3	6.3E-01	2.1E+00	3.6E+00	3.5E+00	4.4E+00	3.5E+00
	2.8E+00	2.2E+00	1.7E+00	1.1E+00	9.3E-01	5.8E-01
	4.2E-01	2.7E-01	1.6E-01			
2015 4561	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 3	3.9E-01	3.3E-01	1.7E-01	5.5E-02	2.7E-02	1.1E-02
	2.9E-03	6.1E-03	0.0E-01	3.0E-03	3.0E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2016 4750	5.4E-04	2.9E-04	0.0E-01	1.0E-05	0.0E-01	1.0E-05
ASSP 3	2.8E-01	4.8E-01	2.4E-01	7.2E-02	4.0E-02	1.9E-02
	1.2E-02	6.1E-03	6.1E-03	6.1E-03	3.0E-03	3.0E-03
	0.0E-01	3.0E-03	0.0E-01			

2017 4750	2.7E-03	1.2E-04	3.8E-05	2.0E-05	0.0E-01	5.0E-06
ASSP 3	3.6E-01	6.3E-01	3.2E-01	1.1E-01	1.1E-01	9.1E-02
	8.4E-02	7.6E-02	7.6E-02	5.8E-02	4.0E-02	3.6E-02
	2.4E-02	2.7E-02	2.7E-02			
2018 5432	1.2E-03	8.0E-04	6.5E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.8E-01	7.9E-01	5.2E-01	2.3E-01	2.6E-01	2.6E-01
	2.1E-01	2.3E-01	2.1E-01	1.4E-01	1.2E-01	1.1E-01
	7.6E-02	7.6E-02	7.0E-02			
2019 6290	3.1E-03	3.8E-04	3.7E-05	1.3E-05	4.4E-06	0.0E-01
ASSP 3	1.1E-01	2.6E-01	1.1E-01	4.6E-02	5.8E-02	5.0E-02
	5.5E-02	2.1E-02	5.2E-02	3.0E-02	2.4E-02	2.7E-02
	2.1E-02	1.8E-02	6.1E-03			
2020 7236	2.2E-03	1.1E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E-01	2.9E-01	1.4E-01	1.2E-01	7.3E-02	1.1E-01
	5.8E-02	4.9E-02	5.2E-02	4.0E-02	1.8E-02	1.2E-02
	9.1E-03	2.1E-02	6.1E-03			
2021 7345	1.2E-03	2.7E-04	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E-01	3.1E-01	1.5E-01	5.8E-02	8.8E-02	7.2E-02
	3.5E-02	5.5E-02	3.3E-02	1.8E-02	2.7E-02	2.4E-02
	6.1E-03	6.1E-03	3.0E-03			
2022 8497	2.3E-03	5.6E-04	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.0E-01	2.9E-01	1.7E-01	4.3E-02	3.0E-02	1.1E-02
	1.7E-02	1.8E-02	9.1E-03	6.1E-03	0.0E-01	3.0E-03
	3.0E-03	0.0E-01	6.1E-03			
2023 9286	5.9E-03	1.5E-03	0.0E-01	8.3E-05	0.0E-01	0.0E-01
ASSP 3	2.8E-01	3.5E-01	1.7E-01	4.9E-02	3.6E-02	8.3E-03
	8.7E-03	3.0E-03	6.1E-03	9.1E-03	6.1E-03	6.1E-03
	0.0E-01	3.0E-03	0.0E-01			
2024 9112	4.7E-03	6.9E-04	2.8E-05	1.5E-05	0.0E-01	0.0E-01
ASSP 3	2.1E-01	3.2E-01	1.4E-01	4.9E-02	2.7E-02	2.5E-02
	2.6E-02	9.1E-03	1.2E-02	0.0E-01	3.0E-03	3.0E-03
	3.0E-03	0.0E-01	0.0E-01			
2025 9592	8.1E-03	7.3E-04	2.6E-05	2.8E-05	0.0E-01	6.9E-06
ASSP 3	1.7E-01	3.1E-01	1.1E-01	4.3E-02	3.0E-02	3.3E-02
	8.7E-03	3.0E-03	9.1E-03	6.1E-03	3.0E-03	3.0E-03
	0.0E-01	6.1E-03	0.0E-01			
2026 9999	4.8E-03	7.3E-04	0.0E-01	2.3E-05	7.7E-06	0.0E-01
ASSP 3	1.9E-01	2.5E-01	1.0E-01	4.3E-02	3.0E-02	1.1E-02
	1.4E-02	9.1E-03	0.0E-01	3.0E-03	3.0E-03	3.0E-03
	0.0E-01	9.1E-03	3.0E-03			
2027 9999	1.3E-03	8.6E-04	4.7E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.6E-01	2.7E-01	9.3E-02	4.3E-02	1.2E-02	1.1E-02
	2.9E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2028 9999	1.6E-03	2.9E-04	0.0E-01	5.0E-06	0.0E-01	0.0E-01
ASSP 3	2.0E-01	3.3E-01	1.4E-01	4.6E-02	1.8E-02	8.3E-03
	5.8E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2029 9999	4.2E-03	3.8E-04	1.7E-05	8.9E-06	0.0E-01	0.0E-01
ASSP 3	1.1E-01	2.2E-01	1.2E-01	5.8E-02	3.3E-02	5.5E-03
	2.9E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	3.0E-03	0.0E-01	0.0E-01			
2030 9999	1.1E-02	2.0E-03	0.0E-01	0.0E-01	0.0E-01	9.6E-06
ASSP 3	1.8E-01	1.9E-01	8.7E-02	1.4E-02	6.1E-03	0.0E-01
	5.8E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			

Fog 11B. August 8-9 (Day 220-221) 1975

DAY 220 HOUR VSBY	NUMBER DENSITY (NO./CC/MICRON) 1ST LINE = DAP		LINES 2,3&4 = ASSP			
2215 9999	1.4E-02	2.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.5E+01	2.0E+01	1.4E+01	1.0E+01	6.1E+00	1.3E+00
	8.8E-01	2.9E-01	1.3E-01	5.2E-02	5.2E-02	4.3E-02
	5.2E-02	3.5E-02	1.7E-02			
2216 9999	2.1E-03	9.8E-05	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	4.1E+01	2.2E+01	1.4E+01	1.1E+01	5.5E+00	1.2E+00
	1.2E+00	2.5E-01	9.4E-02	1.0E-01	1.1E-01	4.3E-02
	1.7E-02	2.6E-02	0.0E-01			
2217 8864	0.0E-01	2.1E-04	0.0E-01	0.0E-01	3.1E-06	0.0E-01
ASSP 4	5.2E+01	2.6E+01	1.5E+01	1.1E+01	5.5E+00	1.5E+00
	9.1E-01	1.6E-01	5.6E-02	7.8E-02	1.0E-01	7.8E-02
	1.7E-02	3.5E-02	8.7E-03			
2218 9999	1.3E-03	2.6E-04	0.0E-01	0.0E-01	0.0E-01	3.1E-06
ASSP 4	2.2E+01	2.1E+01	1.6E+01	1.1E+01	5.7E+00	1.5E+00
	8.1E-01	4.0E-01	1.2E-01	1.1E-01	9.6E-02	5.2E-02
	4.3E-02	0.0E-01	0.0E-01			
2219 9999	7.5E-03	3.5E-04	0.0E-01	4.0E-05	0.0E-01	0.0E-01
ASSP 4	1.5E+01	1.5E+01	1.3E+01	1.0E+01	4.5E+00	1.0E+00
	7.4E-01	2.5E-01	7.5E-02	9.6E-02	7.8E-02	7.8E-02
	8.7E-03	5.2E-02	8.7E-03			
2220 9443	2.6E-03	2.9E-04	2.3E-05	0.0E-01	0.0E-01	6.1E-06
ASSP 4	1.7E+01	1.9E+01	1.5E+01	1.1E+01	4.8E+00	1.3E+00
	8.4E-01	4.3E-01	1.7E-01	1.4E-01	1.6E-01	7.8E-02
	1.7E-02	1.7E-02	1.7E-02			
2221 9999	1.0E-03	8.4E-05	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.7E+01	2.0E+01	1.4E+01	1.1E+01	4.7E+00	1.6E+00
	8.6E-01	3.5E-01	1.4E-01	7.8E-02	9.6E-02	8.7E-02
	9.6E-02	1.7E-02	1.7E-02			
2222 9999	1.8E-03	2.0E-04	4.3E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.0E+01	2.0E+01	1.6E+01	1.0E+01	4.1E+00	1.5E+00
	8.0E-01	2.5E-01	2.2E-01	1.0E-01	1.3E-01	6.1E-02
	6.1E-02	4.3E-02	8.7E-03			
2223 9999	0.0E-01	2.7E-04	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.0E+01	1.8E+01	1.6E+01	1.1E+01	4.7E+00	1.6E+00
	9.3E-01	4.0E-01	1.9E-01	1.1E-01	9.6E-02	9.6E-02
	6.9E-02	3.5E-02	1.7E-02			
2224 6713	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 4	6.7E+01	4.6E+01	3.2E+01	1.8E+01	6.4E+00	1.7E+00
	1.2E+00	2.9E-01	3.4E-01	9.6E-02	1.3E-01	6.1E-02
	5.2E-02	8.7E-03	4.3E-02			
2225 2413	2.1E-03	1.3E-03	3.8E-05	2.0E-05	0.0E-01	0.0E-01
ASSP 4	1.6E+02	1.1E+02	9.1E+01	5.8E+01	2.1E+01	5.6E+00
	3.4E+00	1.4E+00	1.4E+00	1.1E+00	1.1E+00	5.1E-01
	5.8E-01	5.3E-01	3.8E-01			
2226 4974	0.0E-01	1.7E-04	2.2E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.8E+02	1.1E+02	7.7E+01	4.3E+01	1.5E+01	3.8E+00
	2.5E+00	9.7E-01	8.4E-01	7.2E-01	7.3E-01	5.6E-01
	4.2E-01	4.2E-01	4.3E-01			
2227 4676	6.5E-04	1.1E-04	2.3E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.7E+02	1.0E+02	6.7E+01	3.5E+01	1.1E+01	3.2E+00
	1.9E+00	5.2E-01	2.6E-01	2.8E-01	2.5E-01	1.0E-01
	1.3E-01	8.7E-02	4.3E-02			

2228 4610	1.3E-02	8.6E-04	9.4E-05	4.9E-05	0.0E-01	0.0E-01
ASSP 4	9.1E+01	8.[illegible]E+01	7.3E+01	3.8E+01	1.6E+01	3.9E+00
	2.8E+00	1.2E+00	1.3E+00	9.9E-01	8.8E-01	7.4E-01
	5.9E-01	4.7E-01	3.4E-01			
2229 3073	7.4E-04	8.2E-05	0.0E-01	9.3E-06	3.2E-06	0.0E-01
ASSP 4	1.5E+02	1.1E+02	9.3E+01	7.2E+01	1.8E+01	4.9E+00
	2.4E+00	7.2E-01	3.4E-01	5.2E-01	3.2E-01	2.2E-01
	1.1E-01	1.5E-01	1.4E-01			
2230 1481	6.4E-03	1.3E-03	3.1E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 4	9.8E+00	6.0E+01	7.8E+00	9.8E+00	5.6E+01	2.6E+01
	1.7E+01	6.7E+00	6.2E+00	4.9E+00	5.2E+00	3.6E+00
	3.5E+00	2.6E+00	2.6E+00			
2231 2282	2.0E-02	2.8E-03	1.4E-04	3.7E-05	0.0E-01	0.0E-01
ASSP 4	2.0E+01	7.5E+01	2.4E+00	1.2E+02	4.8E+01	1.9E+01
	1.3E+01	4.8E+00	4.3E+00	3.5E+00	3.4E+00	2.6E+00
	2.3E+00	2.0E+00	1.7E+00			
2232 1711	2.2E-03	3.0E-04	3.0E-05	1.0E-05	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.2E+02	1.3E+01	1.3E+02	5.7E+01	2.1E+01
	1.2E+01	3.5E+00	3.0E+00	2.4E+00	2.3E+00	1.7E+00
	1.5E+00	1.4E+00	1.2E+00			
2233 1236	1.2E-02	1.1E-03	1.1E-04	0.0E-01	6.7E-06	4.9E-06
ASSP 4	1.7E+02	1.4E+02	6.8E+00	1.2E+02	7.1E+01	4.5E+01
	2.6E+01	7.4E+00	5.0E+00	4.5E+00	3.6E+00	2.8E+00
	2.5E+00	1.9E+00	1.9E+00			
2234 1010	2.5E-03	4.0E-04	3.0E-05	0.0E-01	0.0E-01	2.6E-06
ASSP 1	5.4E-01	3.0E+00	3.8E+00	2.8E+00	2.3E+00	1.3E+00
	6.7E-01	3.7E-01	1.7E-01	7.9E-02	5.9E-02	4.3E-02
	2.0E-02	1.4E-02	5.9E-03			
2235 791	7.4E-03	6.7E-04	1.7E-04	1.3E-05	2.6E-05	0.0E-01
ASSP 1	1.7E-01	2.2E+00	3.2E+00	2.1E+00	1.7E+00	1.0E+00
	5.2E-01	2.6E-01	1.6E-01	8.5E-02	5.3E-02	3.4E-02
	1.8E-02	4.1E-03	1.2E-02			
2236 1174	2.0E-02	2.0E-03	2.3E-04	1.2E-05	0.0E-01	0.0E-01
ASSP 1	2.5E-01	4.5E+00	6.6E+00	4.8E+00	3.7E+00	2.0E+00
	9.8E-01	5.4E-01	2.7E-01	1.7E-01	8.3E-02	3.4E-02
	2.6E-02	1.2E-02	5.9E-03			
2237 693	9.6E-03	7.9E-04	1.0E-04	2.7E-05	6.1E-06	9.0E-06
ASSP 1	4.0E-01	2.6E+00	3.5E+00	2.5E+00	1.9E+00	1.2E+00
	5.6E-01	3.9E-01	2.0E-01	1.2E-01	6.5E-02	2.8E-02
	2.0E-02	1.8E-02	2.0E-02			
2238 929	1.2E-02	3.0E-03	2.2E-04	2.1E-05	0.0E-01	0.0E-01
ASSP 1	5.8E-02	4.5E+00	7.2E+00	4.6E+00	3.6E+00	1.9E+00
	9.4E-01	5.2E-01	2.4E-01	1.3E-01	6.3E-02	4.5E-02
	2.4E-02	1.2E-02	9.8E-03			
2239 819	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	2.4E-01	3.2E+00	4.6E+00	3.5E+00	2.8E+00	1.5E+00
	7.9E-01	4.3E-01	2.8E-01	1.8E-01	9.5E-02	3.2E-02
	3.4E-02	3.0E-02	2.4E-02			
2240 1685	9.1E-03	1.3E-03	1.7E-04	4.0E-05	2.7E-05	1.0E-05
ASSP 1	4.3E-01	2.4E+00	3.6E+00	2.7E+00	2.1E+00	1.4E+00
	5.9E-01	3.8E-01	2.4E-01	1.3E-01	6.5E-02	4.7E-02
	1.4E-02	2.0E-02	2.0E-02			

2241 1166	1.0E-02	8.4E-04	1.1E-04	0.0E-01	0.0E-01	5.7E-06
ASSP 1	6.[illegible]E-02	3.6E+00	5.6E+00	3.8E+00	2.7E+00	1.7E+00
	8.2E-01	5.4E-01	2.7E-01	1.2E-01	9.1E-02	3.6E-02
	2.9E-02	2.0E-02	1.8E-02			
2242 1131	1.0E-02	1.7E-03	1.5E-04	3.1E-05	3.5E-06	2.6E-06
ASSP 1	1.5E-02	9.6E-01	3.9E+00	4.8E+00	4.7E+00	3.4E+00
	1.9E+00	1.2E+00	6.4E-01	2.9E-01	1.4E-01	1.0E-01
	6.1E-02	2.2E-02	2.0E-02			
2243 723	1.6E-02	2.9E-03	3.5E-04	2.5E-05	5.6E-06	6.3E-06
ASSP 1	1.5E-02	4.3E-01	3.3E+00	4.2E+00	4.3E+00	3.1E+00
	1.7E+00	1.0E+00	4.5E-01	2.5E-01	1.5E-01	5.9E-02
	6.1E-02	4.3E-02	1.8E-02			
2244 624	1.4E-02	4.4E-03	4.9E-04	4.2E-05	2.3E-05	2.5E-05
ASSP 1	7.6E-02	7.4E-01	3.6E+00	4.7E+00	5.0E+00	3.5E+00
	1.9E+00	1.2E+00	5.7E-01	3.2E-01	2.0E-01	1.1E-01
	6.7E-02	3.4E-02	1.6E-02			
2245 767	3.8E-02	6.4E-03	1.1E-03	9.7E-05	5.6E-05	2.8E-05
ASSP 1	2.5E-02	9.5E-01	5.6E+00	6.9E+00	6.2E+00	4.3E+00
	2.2E+00	1.3E+00	6.3E-01	4.3E-01	2.6E-01	1.3E-01
	6.1E-02	4.9E-02	3.9E-02			
2246 978	1.7E-02	4.1E-03	5.5E-04	7.0E-05	2.7E-05	2.5E-05
ASSP 1	1.4E-01	1.4E+00	5.1E+00	5.4E+00	4.9E+00	3.3E+00
	1.9E+00	1.2E+00	6.0E-01	4.6E-01	2.3E-01	1.2E-01
	6.7E-02	5.7E-02	5.1E-02			
2247 1870	1.1E-02	1.9E-03	3.3E-04	7.7E-05	1.9E-05	1.0E-05
ASSP 1	0.0E-01	2.1E-01	2.4E+00	2.9E+00	3.1E+00	2.4E+00
	1.4E+00	1.0E+00	6.2E-01	3.2E-01	2.1E-01	1.3E-01
	6.3E-02	3.6E-02	4.5E-02			
2248 1554	8.1E-03	4.1E-03	5.8E-04	9.2E-05	1.0E-05	2.3E-05
ASSP 1	1.0E-02	1.5E-01	1.1E+00	1.6E+00	1.9E+00	1.6E+00
	9.9E-01	7.8E-01	4.5E-01	2.7E-01	1.5E-01	8.7E-02
	5.7E-02	4.1E-02	2.0E-02			
2249 1653	1.2E-02	2.1E-03	3.8E-04	5.5E-05	3.7E-05	1.6E-05
ASSP 1	1.8E-02	1.3E+00	3.7E+00	3.0E+00	2.7E+00	1.9E+00
	1.3E+00	8.8E-01	5.4E-01	3.1E-01	1.8E-01	1.0E-01
	6.9E-02	2.8E-02	1.4E-02			
2250 3178	9.9E-03	3.0E-03	6.7E-04	9.3E-05	3.5E-05	2.6E-05
ASSP 1	5.1E-02	6.1E-01	2.2E+00	2.5E+00	2.3E+00	1.7E+00
	1.2E+00	8.1E-01	5.4E-01	2.8E-01	1.9E-01	1.1E-01
	6.7E-02	3.9E-02	3.1E-02			
2251 1678	3.1E-02	1.5E-02	2.8E-03	5.9E-04	0.0E-01	0.0E-01
ASSP 1	5.1E-03	1.4E-01	3.6E-01	4.3E-01	5.9E-01	4.5E-01
	3.3E-01	2.4E-01	1.2E-01	8.1E-02	6.7E-02	4.3E-02
	3.0E-02	8.1E-03	1.6E-02			
2252 1281	2.3E-03	1.3E-03	1.8E-04	1.5E-05	9.9E-06	0.0E-01
ASSP 1	1.3E-02	4.0E-01	1.6E+00	1.7E+00	1.9E+00	1.5E+00
	9.3E-01	7.3E-01	5.3E-01	2.6E-01	1.3E-01	1.1E-01
	8.1E-02	5.1E-02	9.8E-03			
2253 1094	4.1E-03	1.0E-03	3.3E-04	2.4E-05	1.6E-05	0.0E-01
ASSP 1	5.1E-03	2.9E-01	1.7E+00	1.8E+00	1.8E+00	1.5E+00
	9.5E-01	7.2E-01	5.2E-01	3.3E-01	2.4E-01	1.4E-01
	1.1E-01	8.7E-02	5.7E-02			

2254 1261	1.0E-02	2.7E-03	3.2E-04	8.6E-05	4.2E-05	1.8E-05
ASSP 2	4.8E-01	1.1E+01	1.6E+01	1.5E+01	1.1E+01	1.3E+01
	1.1E+01	9.8E+00	9.5E+00	7.3E+00	5.9E+00	4.4E+00
	3.6E+00	3.0E+00	2.7E+00			
2255 3391	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 2	3.8E-01	1.6E+01	1.5E+01	1.3E+01	9.2E+00	1.1E+01
	9.1E+00	7.8E+00	7.1E+00	6.1E+00	5.0E+00	3.5E+00
	3.0E+00	2.6E+00	2.5E+00			
2256 1778	2.6E-03	6.0E-04	1.5E-04	1.5E-05	1.3E-05	7.3E-06
ASSP 3	8.7E-03	2.4E-01	7.9E-01	8.4E-01	1.1E+00	9.5E-01
	9.2E-01	9.1E-01	7.6E-01	5.5E-01	5.4E-01	4.1E-01
	3.0E-01	2.8E-01	2.0E-01			
2257 1136	9.5E-03	2.2E-03	4.2E-04	9.5E-05	8.6E-05	3.1E-05
ASSP 3	1.3E-02	1.3E-01	3.6E-01	5.4E-01	1.0E+00	1.3E+00
	1.3E+00	1.3E+00	1.2E+00	9.7E-01	8.0E-01	6.6E-01
	4.7E-01	4.4E-01	3.5E-01			
2258 1762	1.2E-02	3.3E-03	1.4E-03	4.7E-04	1.8E-04	8.8E-05
ASSP 4	3.3E+02	1.7E+02	7.8E+01	4.0E+01	2.8E+01	1.7E+01
	7.7E+00	4.3E+00	3.4E+00	2.7E+00	2.0E+00	1.9E+00
	1.9E+00	1.7E+00	1.6E+00			
2259 1556	7.9E-03	1.4E-03	3.6E-04	5.7E-05	2.4E-05	2.8E-05
ASSP 4	3.7E+02	1.5E+02	5.8E+01	3.1E+01	2.2E+01	1.5E+01
	8.1E+00	5.8E+00	4.9E+00	4.0E+00	2.9E+00	2.6E+00
	2.6E+00	2.6E+00	2.1E+00			
2300 1379	7.6E-03	2.2E-03	6.1E-04	1.5E-04	9.7E-05	5.4E-05
ASSP 4	1.4E+02	2.0E+02	6.4E+01	3.3E+01	2.4E+01	1.5E+01
	8.4E+00	6.0E+00	4.6E+00	3.5E+00	3.0E+00	2.7E+00
	2.4E+00	2.5E+00	2.1E+00			
2301 1499	3.0E-03	1.2E-03	4.4E-04	8.4E-05	2.7E-05	1.7E-05
ASSP 4	1.1E+02	3.6E+01	6.3E+01	2.3E+01	1.2E+01	7.7E+00
	3.6E+00	2.6E+00	2.1E+00	2.0E+00	1.3E+00	1.4E+00
	1.2E+00	9.8E-01	1.1E+00			
2303 2253	4.6E-03	1.5E-03	5.2E-04	1.5E-04	1.1E-04	6.5E-05
ASSP 1	5.1E-03	2.7E-02	4.7E-02	2.5E-01	6.4E-01	9.8E-01
	9.0E-01	9.2E-01	7.2E-01	5.9E-01	4.0E-01	3.1E-01
	2.3E-01	1.4E-01	1.2E-01			
2304 1675	5.8E-03	1.2E-03	4.4E-04	1.3E-04	6.8E-05	2.9E-05
ASSP 1	0.0E-01	4.2E-03	6.1E-02	2.5E-01	5.0E-01	6.4E-01
	6.2E-01	5.5E-01	3.7E-01	3.0E-01	2.2E-01	1.5E-01
	9.1E-02	8.5E-02	6.9E-02			
2306 1997	1.1E-02	2.6E-03	6.3E-04	1.9E-04	1.2E-04	7.9E-05
ASSP 2	1.1E+01	1.7E+01	9.1E+00	3.9E+00	1.9E+00	2.1E+00
	1.6E+00	1.9E+00	1.6E+00	1.7E+00	1.4E+00	1.2E+00
	1.3E+00	1.2E+00	1.2E+00			
2307 1497	1.9E-02	3.7E-03	1.6E-03	4.4E-04	2.0E-04	8.8E-05
ASSP 2	9.6E+00	1.7E+01	1.2E+01	5.5E+00	2.7E+00	2.9E+00
	2.4E+00	2.1E+00	2.3E+00	2.0E+00	2.2E+00	1.6E+00
	1.7E+00	1.4E+00	1.6E+00			

2308 1310	2.6E-02	4.9E-03	1.6E-03	4.6E-04	1.7E-04	8.6E-05
ASSP 1	5.6E-02	1.0E-01	2.8E-01	5.3E-01	1.2E+00	1.7E+00
	1.5E+00	1.2E+00	9.3E-01	6.7E-01	5.5E-01	3.2E-01
	2.3E-01	1.5E-01	1.1E-01			
2309 1275	6.7E-02	1.2E-02	4.8E-03	1.6E-03	7.0E-04	6.6E-04
ASSP 1	0.0E-01	1.0E-02	4.1E-02	4.6E-01	9.6E-01	1.4E+00
	1.2E+00	1.1E+00	7.5E-01	5.3E-01	3.5E-01	3.1E-01
	1.9E-01	1.6E-01	9.0E-02			
2310 1229	1.7E-03	1.1E-03	4.9E-04	9.4E-05	4.6E-05	4.1E-05
ASSP 1	0.0E-01	8.4E-03	7.3E-02	3.5E-01	8.2E-01	1.4E+00
	1.2E+00	1.0E+00	8.0E-01	5.8E-01	4.2E-01	3.2E-01
	1.9E-01	1.4E-01	8.8E-02			
2311 1468	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	0.0E-01	1.0E-02	1.3E-01	6.4E-01	1.2E+00	1.7E+00
	1.4E+00	1.3E+00	1.0E+00	7.4E-01	5.2E-01	3.5E-01
	2.3E-01	1.5E-01	1.1E-01			
2313 1239	3.3E-03	2.0E-03	8.3E-04	2.1E-04	8.9E-05	4.6E-05
ASSP 1	7.5E-04	2.9E-03	4.0E-03	6.9E-03	5.6E-03	6.6E-03
	6.8E-03	5.9E-03	4.6E-03	3.3E-03	2.4E-03	1.6E-03
	8.0E-04	7.5E-04	5.3E-04			
2314 1519	7.3E-03	1.1E-03	7.3E-04	1.5E-04	3.8E-05	2.0E-05
ASSP 1	3.1E-04	4.7E-03	7.3E-03	8.7E-03	7.2E-03	8.7E-03
	6.6E-03	5.9E-03	5.4E-03	4.1E-03	3.1E-03	2.0E-03
	1.1E-03	6.5E-04	1.9E-04			
2315 1519	5.6E-03	2.1E-03	6.6E-04	1.2E-04	4.4E-05	1.6E-05
ASSP 1	8.1E-04	5.6E-03	7.9E-03	8.8E-03	8.1E-03	8.6E-03
	6.6E-03	5.2E-03	3.6E-03	1.8E-03	2.1E-03	9.0E-04
	6.0E-04	7.0E-04	2.4E-04			
2316 1411	4.1E-03	1.4E-03	4.5E-04	7.7E-05	5.2E-05	2.5E-05
ASSP 1	5.6E-04	1.0E-02	1.5E-02	1.5E-02	1.0E-02	7.4E-03
	6.2E-03	3.9E-03	2.4E-03	1.9E-03	1.3E-03	7.5E-04
	4.0E-04	2.5E-04	3.9E-04			
2317 1527	3.9E-03	1.9E-03	5.5E-04	6.4E-05	6.5E-05	2.0E-05
ASSP 1	1.4E-03	9.1E-03	1.1E-02	1.1E-02	9.1E-03	7.5E-03
	6.4E-03	5.0E-03	2.6E-03	2.0E-03	1.8E-03	1.7E-03
	6.0E-04	3.5E-04	3.9E-04			
2318 1446	6.1E-03	1.5E-03	4.0E-04	1.6E-04	7.2E-05	4.4E-05
ASSP 1	2.7E-03	1.1E-02	9.3E-03	9.4E-03	9.0E-03	8.0E-03
	5.7E-03	5.0E-03	2.9E-03	2.4E-03	1.8E-03	1.0E-03
	7.0E-04	4.5E-04	2.4E-04			
2319 1303	3.4E-03	1.4E-03	2.4E-04	1.0E-04	3.9E-05	2.5E-05
ASSP 1	3.4E-03	1.9E-02	2.0E-02	1.7E-02	1.4E-02	1.1E-02
	7.4E-03	4.7E-03	3.3E-03	1.9E-03	1.6E-03	1.0E-03
	8.5E-04	4.0E-04	2.4E-04			

2323 6190	1.7E-03	6.[illegible]-04	1.2E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.8E-03	3.[illegible]-03	4.0E-03	4.8E-03	5.5E-03	5.9E-03
	4.0E-03	4.[illegible]-03	2.7E-03	2.4E-03	1.6E-03	9.4E-04
	9.4E-04	9.4E-04	0.0E-01			
2324 7386	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.2E-04	1.9E-04	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2325 8298	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.2E-04	5.6E-04	0.0E-01	0.0E-01	1.6E-04	1.4E-04
	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
2326 7895	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.5E-03	1.3E-03	9.0E-04	9.0E-04	1.4E-03	7.2E-04
	4.5E-04	7.9E-04	9.4E-04	3.1E-04	4.7E-04	1.6E-04
	1.6E-04	0.0E-01	1.6E-04			
2335 1477	5.0E-03	1.4E-03	4.3E-04	3.7E-05	1.9E-05	2.3E-05
ASSP 3	7.9E-03	1.3E-02	1.5E-02	1.3E-02	1.5E-02	1.3E-02
	1.1E-02	1.2E-02	1.1E-02	8.8E-03	8.0E-03	6.3E-03
	5.3E-03	3.3E-03	2.7E-03			
2336 1580	3.5E-03	1.1E-03	2.9E-04	3.0E-05	2.4E-05	7.5E-06
ASSP 3	4.5E-03	1.4E-02	1.2E-02	8.8E-03	1.1E-02	9.8E-03
	8.5E-03	8.0E-03	7.2E-03	7.3E-03	6.7E-03	4.9E-03
	3.8E-03	3.1E-03	2.1E-03			
2337 1791	2.2E-03	7.7E-04	2.3E-04	2.3E-05	3.1E-06	6.8E-06
ASSP 1	1.5E-04	3.6E-03	5.3E-03	7.4E-03	6.2E-03	5.9E-03
	4.8E-03	3.6E-03	2.6E-03	1.0E-03	7.6E-04	4.5E-04
	3.6E-04	6.1E-05	1.2E-04			
2338 1167	3.6E-03	1.3E-03	3.9E-04	2.8E-05	1.5E-05	2.3E-05
ASSP 1	4.5E-04	4.4E-03	4.9E-03	7.5E-03	7.6E-03	7.3E-03
	4.5E-03	3.7E-03	2.3E-03	1.5E-03	1.3E-03	8.5E-04
	3.9E-04	3.0E-04	1.2E-04			
2339 952	5.9E-03	1.4E-03	2.8E-04	2.8E-05	1.1E-05	8.3E-06
ASSP 2	8.7E-02	3.7E-01	2.3E-01	1.7E-01	8.2E-02	6.3E-02
	4.7E-02	3.3E-02	2.7E-02	2.9E-02	2.5E-02	2.0E-02
	1.8E-02	1.6E-02	1.4E-02			
2340 972	7.2E-03	2.0E-03	3.1E-04	5.1E-05	3.1E-05	3.1E-05
ASSP 2	1.9E-01	4.0E-01	2.0E-01	1.4E-01	6.8E-02	6.0E-02
	4.4E-02	4.5E-02	3.3E-02	3.4E-02	3.3E-02	2.3E-02
	1.9E-02	1.7E-02	1.8E-02			
2341 849	7.7E-03	1.2E-03	4.8E-04	6.9E-05	2.2E-05	1.6E-05
ASSP 2	9.9E-02	3.3E-01	1.5E-01	1.3E-01	6.3E-02	6.0E-02
	4.8E-02	3.9E-02	3.2E-02	3.3E-02	3.5E-02	2.3E-02
	2.4E-02	2.0E-02	1.7E-02			

2342 869	8.5E-03	2.1E-03	5.4E-04	5.5E-05	5.6E-05	2.1E-05
ASSP 1	2.9E-04	1.1E-02	1.7E-02	2.0E-02	2.0E-02	1.5E-02
	1.1E-02	7.9E-03	5.7E-03	3.3E-03	1.8E-03	1.4E-03
	6.0E-04	2.3E-04	2.2E-04			
2343 1010	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 1	5.2E-04	1.2E-02	1.7E-02	2.0E-02	2.1E-02	1.5E-02
	1.0E-02	6.9E-03	5.9E-03	3.8E-03	1.9E-03	7.8E-04
	6.0E-04	2.3E-04	1.8E-04			
2344 888	1.2E-02	4.1E-03	1.1E-03	1.3E-04	4.5E-05	4.0E-05
ASSP 4	5.7E-01	6.8E+00	1.4E+00	9.2E-01	4.6E-01	3.3E-01
	2.0E-01	1.1E-01	8.4E-02	7.0E-02	5.5E-02	5.0E-02
	4.3E-02	2.9E-02	3.8E-02			
2345 818	6.1E-03	2.0E-03	3.3E-04	8.7E-05	2.7E-05	2.0E-05
ASSP 4	1.6E+01	3.9E+00	1.8E+00	1.2E+00	6.5E-01	5.3E-01
	3.9E-01	2.3E-01	2.0E-01	1.6E-01	1.2E-01	1.0E-01
	8.8E-02	9.5E-02	7.3E-02			
2346 1137	5.3E-03	2.3E-03	5.7E-04	5.0E-05	1.9E-05	5.0E-05
ASSP 4	1.7E+00	4.9E+00	1.9E+00	1.2E+00	7.4E-01	4.9E-01
	3.2E-01	1.7E-01	1.5E-01	1.1E-01	8.9E-02	6.6E-02
	6.4E-02	7.1E-02	5.7E-02			
2347 1241	3.5E-03	1.7E-03	4.2E-04	1.8E-05	2.9E-05	1.5E-05
ASSP 4	5.8E+00	5.0E+00	1.6E+00	1.1E+00	6.1E-01	4.1E-01
	2.7E-01	1.3E-01	1.0E-01	7.2E-02	6.6E-02	5.1E-02
	4.2E-02	4.1E-02	3.9E-02			
2348 1242	3.4E-03	1.1E-03	3.5E-04	2.3E-05	2.4E-05	1.7E-05
ASSP 4	1.4E+01	4.5E+00	1.9E+00	1.4E+00	7.2E-01	5.0E-01
	2.8E-01	1.3E-01	8.5E-02	6.4E-02	4.8E-02	4.0E-02
	3.5E-02	2.6E-02	2.8E-02			
2349 1433	1.9E-03	7.4E-04	2.0E-04	3.0E-05	2.0E-05	7.5E-06
ASSP 4	4.0E+00	5.5E+00	1.8E+00	1.2E+00	6.0E-01	4.3E-01
	2.5E-01	1.2E-01	9.2E-02	7.3E-02	5.0E-02	4.2E-02
	2.4E-02	2.3E-02	2.6E-02			
2350 1438	1.7E-03	6.0E-04	3.3E-04	4.9E-05	3.6E-05	2.7E-05
ASSP 4	1.2E+01	3.6E+00	1.7E+00	1.3E+00	5.9E-01	4.7E-01
	2.4E-01	1.1E-01	7.5E-02	5.9E-02	4.3E-02	2.7E-02
	2.4E-02	2.4E-02	1.8E-02			
2351 1355	1.3E-02	6.3E-03	1.9E-03	2.2E-04	2.0E-04	9.8E-05
ASSP 4	1.5E+01	7.8E+00	1.7E+00	1.0E+00	4.5E-01	3.4E-01
	1.6E-01	7.7E-02	5.8E-02	5.0E-02	2.8E-02	2.9E-02
	1.7E-02	1.7E-02	1.2E-02			
2352 1124	3.3E-03	1.0E-03	3.6E-04	2.2E-05	4.5E-05	1.1E-05
ASSP 4	1.6E+01	3.2E+00	1.6E+00	1.0E+00	5.3E-01	3.7E-01
	1.7E-01	7.7E-02	6.6E-02	4.7E-02	3.3E-02	2.2E-02
	1.6E-02	2.0E-02	1.4E-02			

2354 1435	1.0E-02	3.6E-03	7.6E-04	2.3E-04	7.1E-05	8.4E-05
ASSP 3	4.4E-01	5.6E-01	3.5E-01	2.0E-01	2.4E-01	2.2E-01
	2.3E-01	2.2E-01	1.8E-01	1.3E-01	1.1E-01	7.0E-02
	4.2E-02	1.8E-02	8.8E-03			
2355 1333	5.3E-02	1.7E-02	2.1E-03	8.9E-04	6.0E-04	3.9E-04
ASSP 3	5.3E-01	6.0E-01	2.7E-01	2.1E-01	2.6E-01	2.3E-01
	2.2E-01	2.1E-01	1.5E-01	8.6E-02	7.3E-02	6.2E-02
	4.8E-02	1.3E-02	1.1E-02			
2356 1597	5.4E-03	1.0E-03	3.8E-04	4.0E-05	3.5E-05	2.5E-05
ASSP 3	4.7E-01	8.1E-01	6.3E-01	4.4E-01	3.9E-01	3.0E-01
	2.7E-01	2.5E-01	1.7E-01	1.4E-01	9.5E-02	4.8E-02
	3.3E-02	1.8E-02	2.9E-02			
2357 1992	3.4E-02	4.2E-03	1.2E-03	6.8E-05	3.7E-04	1.2E-04
ASSP 3	7.0E-01	9.6E-01	7.9E-01	3.9E-01	3.8E-01	2.4E-01
	2.1E-01	1.8E-01	1.1E-01	9.5E-02	6.6E-02	4.6E-02
	4.6E-02	2.2E-02	1.3E-02			
2358 1670	1.3E-03	6.5E-04	1.5E-04	3.0E-05	4.4E-05	2.0E-05
ASSP 3	3.6E-01	4.1E-01	2.3E-01	2.2E-01	2.3E-01	2.1E-01
	1.6E-01	1.4E-01	1.1E-01	9.3E-02	5.7E-02	1.8E-02
	3.3E-02	1.3E-02	2.2E-03			
2359 1849	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 3	6.0E-01	7.2E-01	3.7E-01	2.2E-01	2.6E-01	2.1E-01
	1.9E-01	1.6E-01	1.1E-01	9.7E-02	7.5E-02	4.6E-02
	1.3E-02	1.1E-02	6.6E-03			

DAY 221 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

0127 1542	2.7E-03	9.2E-04	2.4E-04	6.4E-05	5.3E-05	1.1E-05
ASSP 2	2.3E+00	3.3E+01	4.0E+01	1.2E+01	3.9E+00	2.7E+00
	1.1E+00	9.6E-01	8.6E-01	7.3E-01	8.0E-01	6.1E-01
	6.1E-01	6.5E-01	5.2E-01			
0128 1512	1.7E-03	6.6E-04	3.2E-04	8.9E-05	2.2E-05	3.2E-05
ASSP 2	2.1E+00	4.0E+01	4.1E+01	1.8E+01	3.5E+00	2.6E+00
	9.5E-01	7.1E-01	8.2E-01	7.0E-01	6.7E-01	6.7E-01
	6.2E-01	5.0E-01	6.2E-01			
0129 1677	2.4E-03	7.5E-04	2.9E-04	8.3E-05	4.1E-05	4.5E-05
ASSP 2	2.4E+00	4.3E+01	3.6E+01	2.0E+01	3.0E+00	1.7E+00
	1.1E+00	6.7E-01	6.9E-01	6.1E-01	6.0E-01	5.3E-01
	4.3E-01	4.7E-01	6.1E-01			

0150 2476	7.4E-03	1.1E-03	2.7E-04	7.0E-05	7.9E-05	8.1E-05
ASSP 2	6.5E+00	4.1E+01	2.8E+01	7.3E+00	2.0E+00	1.5E+00
	1.1E+00	7.9E-01	8.3E-01	7.2E-01	7.1E-01	4.6E-01
	3.9E-01	4.4E-01	3.9E-01			
0151 2082	8.6E-03	5.9E-04	1.9E-04	4.0E-05	1.4E-05	2.0E-05
ASSP 2	6.7E+00	4.3E+01	3.3E+01	8.2E+00	1.5E+00	1.3E+00
	7.5E-01	7.1E-01	6.0E-01	5.8E-01	5.1E-01	3.7E-01
	4.1E-01	3.9E-01	4.6E-01			
0152 2578	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 2	4.4E+00	6.5E+00	4.4E+00	2.1E+00	1.3E+00	1.1E+00
	8.7E-01	8.7E-01	7.4E-01	5.7E-01	5.7E-01	3.4E-01
	1.8E-01	2.4E-01	1.6E-01			
0153 3842	5.5E-03	4.6E-04	5.0E-05	5.2E-05	5.3E-05	1.3E-05
ASSP 3	4.3E-03	1.4E-01	1.3E-01	3.0E-01	3.7E-01	4.0E-01
	3.5E-01	3.6E-01	2.2E-01	2.1E-01	1.6E-01	1.0E-01
	7.0E-02	6.1E-02	3.6E-02			
0154 4235	7.8E-03	4.3E-04	2.8E-04	0.0E-01	2.5E-05	5.5E-05
ASSP 3	4.3E-03	6.4E-02	1.2E-01	2.1E-01	2.2E-01	2.4E-01
	2.1E-01	1.6E-01	2.0E-01	1.2E-01	8.8E-02	6.4E-02
	5.2E-02	5.8E-02	5.2E-02			
0155 4412	4.1E-03	2.7E-04	5.8E-05	3.1E-05	2.1E-05	2.3E-05
ASSP 3	4.3E-03	7.9E-02	1.1E-01	2.1E-01	2.4E-01	2.5E-01
	2.2E-01	2.2E-01	2.1E-01	1.6E-01	1.6E-01	1.3E-01
	7.0E-02	6.4E-02	4.3E-02			
0156 5019	3.1E-03	3.5E-04	2.2E-04	8.9E-05	4.0E-05	2.9E-05
ASSP 3	0.0E-01	8.9E-02	1.3E-01	2.4E-01	2.7E-01	2.5E-01
	2.3E-01	1.9E-01	1.8E-01	1.3E-01	9.7E-02	5.8E-02
	5.5E-02	5.5E-02	2.7E-02			
0157 5652	7.1E-04	7.8E-05	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.7E-03	6.4E-02	1.6E-01	2.3E-01	2.2E-01	2.1E-01
	2.0E-01	1.6E-01	1.4E-01	1.1E-01	9.1E-02	4.6E-02
	2.1E-02	3.0E-02	2.4E-02			
0158 5058	5.9E-03	6.5E-04	4.2E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.7E-02	1.1E-01	1.1E-01	2.2E-01	2.8E-01	2.9E-01
	1.8E-01	2.1E-01	1.6E-01	1.3E-01	1.2E-01	7.6E-02
	4.9E-02	2.1E-02	3.0E-02			
0159 5727	9.8E-03	1.1E-03	7.0E-05	0.0E-01	2.5E-05	1.8E-05
ASSP 3	4.3E-03	6.4E-02	1.7E-01	3.1E-01	3.3E-01	3.1E-01
	2.5E-01	2.7E-01	2.6E-01	2.1E-01	1.6E-01	1.2E-01
	8.5E-02	4.9E-02	3.3E-02			
0200 5752	7.8E-03	2.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	0.0E-01	3.9E-02	6.9E-02	1.4E-01	2.0E-01	1.7E-01
	1.7E-01	1.6E-01	8.5E-02	8.8E-02	8.8E-02	4.3E-02
	4.0E-02	3.0E-02	9.1E-03			

0203 2605	1.1E-02	1.9E-03	2.8E-04	3.0E-05	2.0E-05	0.0E-01
ASSP 2	4.3E+00	4.0E+01	2.3E+01	7.4E+00	9.3E-01	1.0E+00
	5.6E-01	6.6E-01	7.2E-01	6.3E-01	5.0E-01	5.1E-01
	4.9E-01	5.3E-01	4.6E-01			
0204 3816	9.8E-03	2.6E-03	2.8E-04	7.4E-05	0.0E-01	1.8E-05
ASSP 2	4.6E+00	3.4E+01	8.5E+00	2.6E+00	4.2E-01	4.5E-01
	3.1E-01	2.8E-01	3.0E-01	2.7E-01	2.7E-01	3.2E-01
	2.6E-01	2.0E-01	2.1E-01			

0215 1991	5.6E-03	9.5E-04	2.4E-04	8.2E-05	7.1E-05	4.1E-05
ASSP 2	4.2E+00	4.1E+01	4.5E+01	1.0E+01	2.0E+00	1.8E+00
	1.3E+00	1.4E+00	1.2E+00	1.1E+00	1.0E+00	6.9E-01
	6.1E-01	5.8E-01	5.0E-01			
0216 1428	1.1E-02	1.4E-03	3.3E-04	1.0E-04	9.7E-05	5.7E-05
ASSP 2	2.1E+00	4.5E+01	7.6E+01	1.6E+01	4.4E+00	2.9E+00
	1.5E+00	1.6E+00	1.3E+00	1.1E+00	9.4E-01	7.4E-01
	6.1E-01	4.9E-01	5.1E-01			
0217 1453	5.9E-03	1.4E-03	3.3E-04	7.9E-05	7.5E-05	6.3E-05
ASSP 2	1.9E+00	4.7E+01	7.5E+01	1.8E+01	6.6E+00	4.0E+00
	1.9E+00	1.6E+00	1.5E+00	1.1E+00	1.2E+00	8.5E-01
	7.0E-01	6.0E-01	5.0E-01			

0230 2020	3.9E-03	3.6E-04	7.0E-05	6.2E-05	5.0E-05	6.1E-05
ASSP 2	4.9E+00	5.1E+01	4.6E-02	1.2E+01	3.0E+00	2.0E+00
	1.2E+00	9.2E-01	9.1E-01	6.9E-01	7.0E-01	4.8E-01
	3.4E-01	3.5E-01	3.5E-01			
0231 2155	3.4E-03	3.3E-04	1.3E-04	2.1E-05	2.9E-05	3.1E-05
ASSP 2	6.1E+00	5.0E+01	7.1E+01	5.6E+00	2.4E+00	1.3E+00
	6.6E-01	7.8E-01	6.4E-01	5.0E-01	4.9E-01	3.9E-01
	4.3E-01	4.1E-01	3.3E-01			
0232 2063	1.7E-03	2.5E-04	8.0E-05	1.6E-05	1.8E-05	1.3E-05
ASSP 2	8.4E+00	4.8E+01	6.0E+01	4.3E+00	1.4E+00	8.7E-01
	5.6E-01	6.2E-01	5.5E-01	5.2E-01	6.3E-01	3.2E-01
	3.3E-01	2.4E-01	3.2E-01			

0245 2008	1.3E-03	2.6E-04	6.6E-05	2.0E-05	1.0E-05	2.0E-05
ASSP 2	3.4E+00	4.9E+01	5.3E+01	1.2E+01	2.6E+00	1.8E+00
	1.3E+00	1.3E+00	1.2E+00	9.8E-01	8.9E-01	6.7E-01
	4.6E-01	5.3E-01	4.4E-01			
0246 1578	1.9E-03	2.3E-04	1.0E-04	2.0E-05	2.4E-05	1.5E-05
ASSP 2	2.9E+00	4.9E+01	5.7E+01	1.4E+01	2.5E+00	2.2E+00
	1.5E+00	1.5E+00	1.4E+00	1.0E+00	1.2E+00	7.6E-01
	6.7E-01	5.7E-01	4.9E-01			
0247 1462	3.6E-03	4.7E-04	3.6E-05	6.2E-05	3.8E-05	1.9E-05
ASSP 2	1.7E+00	5.2E+01	7.5E+01	1.8E+01	2.9E+00	2.0E+00
	1.5E+00	1.4E+00	1.2E+00	1.3E+00	1.0E+00	8.3E-01
	6.4E-01	5.9E-01	5.1E-01			

0300	732	3.1E-02	5.3E-03	4.6E-04	0.0E-01	4.5E-05	1.3E-05
ASSP 2		1.3E+00	4.0E+01	6.5E+01	2.5E+01	1.7E+01	9.4E+00
		5.5E+00	5.4E+00	5.0E+00	4.2E+00	4.1E+00	3.2E+00
		2.4E+00	2.0E+00	2.0E+00			
0301	773	4.0E-02	5.7E-03	5.7E-04	1.0E-04	4.1E-05	4.0E-05
ASSP 2		2.3E+00	4.3E+01	7.0E+01	2.7E+01	1.9E+01	8.9E+00
		4.9E+00	4.9E+00	4.7E+00	4.1E+00	3.5E+00	3.1E+00
		2.5E+00	1.9E+00	1.8E+00			
0302	756	1.4E-02	3.2E-03	2.4E-04	1.7E-05	2.9E-05	3.4E-05
ASSP 2		2.8E+00	4.2E+01	7.1E+01	2.4E+01	1.8E+01	9.0E+00
		5.0E+00	5.2E+00	4.8E+00	4.8E+00	4.5E+00	3.7E+00
		2.8E+00	2.9E+00	2.3E+00			
0315	644	9.9E-03	2.2E-03	1.7E-04	2.5E-05	1.7E-05	6.2E-06
ASSP 2		1.7E+00	4.0E+01	6.8E+01	2.8E+01	2.1E+01	9.4E+00
		5.3E+00	5.5E+00	5.1E+00	4.0E+00	4.2E+00	3.1E+00
		2.5E+00	2.3E+00	2.0E+00			
0316	707	9.3E-03	1.6E-03	1.4E-04	5.5E-06	1.5E-05	8.2E-06
ASSP 2		1.7E+00	3.9E+01	6.8E+01	2.8E+01	2.0E+01	9.8E+00
		4.9E+00	4.5E+00	4.1E+00	3.6E+00	3.4E+00	2.7E+00
		2.3E+00	2.0E+00	2.0E+00			
0317	676	1.1E-02	2.5E-03	1.5E-04	2.4E-05	1.1E-05	2.4E-05
ASSP 2		1.1E+00	3.8E+01	2.9E+00	2.7E+01	2.1E+01	9.2E+00
		4.1E+00	3.9E+00	3.7E+00	3.3E+00	3.2E+00	2.8E+00
		2.3E+00	2.3E+00	2.3E+00			
0330	622	9.3E-03	3.7E-03	5.3E-04	4.7E-05	3.9E-05	3.5E-05
ASSP 2		8.7E-01	4.0E+01	3.3E-01	3.5E+01	2.6E+01	1.2E+01
		6.2E+00	6.3E+00	5.3E+00	4.6E+00	4.4E+00	3.4E+00
		2.9E+00	2.5E+00	2.2E+00			
0331	719	1.4E-02	3.8E-03	6.9E-04	6.3E-05	7.5E-05	4.7E-05
ASSP 2		7.5E-01	4.3E+01	1.3E+00	2.7E+01	2.2E+01	9.4E+00
		5.6E+00	5.7E+00	4.3E+00	4.4E+00	3.9E+00	3.0E+00
		2.9E+00	2.2E+00	2.1E+00			
0332	774	1.8E-02	2.7E-03	3.7E-04	6.2E-05	3.3E-05	3.1E-05
ASSP 2		1.9E+00	4.3E+01	3.0E-01	2.3E+01	1.7E+01	7.4E+00
		3.9E+00	3.7E+00	3.2E+00	3.3E+00	2.9E+00	2.3E+00
		1.9E+00	1.8E+00	1.6E+00			
0345	827	1.3E-02	1.9E-03	1.6E-04	2.3E-05	1.6E-05	0.0E-01
ASSP 2		7.4E-01	4.4E+01	7.1E+00	2.5E+01	1.8E+01	8.7E+00
		3.4E+00	3.3E+00	2.8E+00	2.3E+00	2.5E+00	1.6E+00
		1.3E+00	1.2E+00	9.7E-01			
0346	768	1.5E-02	2.7E-03	2.0E-04	7.0E-05	4.7E-05	1.7E-05
ASSP 2		1.1E+00	4.1E+01	9.9E+00	2.9E+01	2.1E+01	1.0E+01
		5.1E+00	4.2E+00	4.0E+00	3.1E+00	3.1E+00	2.3E+00
		1.8E+00	1.7E+00	1.6E+00			
0347	724	1.6E-02	1.4E-03	1.7E-04	5.9E-05	2.3E-05	4.2E-05
ASSP 2		6.7E-01	3.5E+01	5.1E+00	3.3E+01	2.4E+01	1.3E+01
		6.6E+00	5.2E+00	4.8E+00	4.1E+00	3.8E+00	2.7E+00
		2.3E+00	1.9E+00	1.8E+00			

0400 594	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 2	1.6E+00	3.6E+01	7.2E+01	3.2E+01	2.5E+01	1.1E+01
	4.0E+00	3.9E+00	3.2E+00	2.9E+00	2.8E+00	2.1E+00
	1.7E+00	1.6E+00	1.3E+00			
0401 577	2.5E-02	3.3E-03	5.6E-04	2.1E-05	0.0E-01	0.0E-01
ASSP 2	7.6E-01	3.3E+01	7.5E+01	3.1E+01	2.5E+01	1.1E+01
	4.1E+00	3.9E+00	3.6E+00	3.2E+00	3.2E+00	2.3E+00
	1.9E+00	1.7E+00	1.5E+00			
0402 545	5.1E-02	6.8E-03	1.3E-03	0.0E-01	0.0E-01	1.7E-05
ASSP 2	9.9E-01	2.9E+01	5.3E-02	3.3E+01	2.8E+01	1.3E+01
	4.3E+00	3.9E+00	3.4E+00	3.2E+00	3.2E+00	2.4E+00
	2.2E+00	1.9E+00	1.7E+00			
0415 555	2.6E-02	3.2E-03	2.1E-04	0.0E-01	0.0E-01	2.8E-05
ASSP 2	1.7E-01	1.5E+01	1.3E+01	3.6E+01	2.5E+01	1.9E+01
	5.7E+00	3.2E+00	3.0E+00	2.3E+00	1.9E+00	1.5E+00
	1.3E+00	1.2E+00	8.5E-01			
0416 532	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 2	2.3E-01	2.1E+01	1.9E+01	3.6E+01	2.2E+01	1.6E+01
	5.4E+00	3.3E+00	3.1E+00	2.2E+00	2.0E+00	1.5E+00
	1.3E+00	1.1E+00	9.1E-01			
0417 563	1.6E-02	2.2E-03	5.6E-04	0.0E-01	0.0E-01	0.0E-01
ASSP 2	3.6E-01	2.2E+01	1.1E+01	3.9E+01	2.5E+01	1.7E+01
	5.6E+00	3.0E+00	2.9E+00	2.3E+00	1.9E+00	1.5E+00
	1.2E+00	8.3E-01	9.5E-01			
0430 889	8.6E-02	7.8E-03	2.8E-04	1.5E-04	0.0E-01	7.3E-05
ASSP 2	2.7E-01	3.0E+01	2.7E+01	4.5E+01	1.0E+01	7.8E+00
	2.2E+00	8.2E-01	6.6E-01	5.4E-01	5.7E-01	3.8E-01
	3.0E-01	3.2E-01	3.2E-01			
0431 923	1.8E-03	8.6E-05	9.4E-06	0.0E-01	0.0E-01	0.0E-01
ASSP 2	4.6E-01	3.1E+01	2.0E+01	4.6E+01	8.1E+00	5.4E+00
	1.9E+00	7.9E-01	8.3E-01	4.9E-01	5.5E-01	4.8E-01
	3.6E-01	2.9E-01	2.8E-01			
0432 774	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38	1.7E+38
ASSP 2	3.9E-01	3.3E+01	2.5E+01	4.6E+01	9.1E+00	6.1E+00
	1.9E+00	7.8E-01	6.5E-01	6.1E-01	4.5E-01	4.6E-01
	2.7E-01	3.0E-01	2.2E-01			
0445 733	2.3E-03	3.6E-05	0.0E-01	0.0E-01	4.2E-06	0.0E-01
ASSP 2	3.1E-01	3.7E+01	4.8E+01	5.4E+01	1.0E+01	7.6E+00
	1.8E+00	8.1E-01	6.7E-01	5.2E-01	4.6E-01	3.6E-01
	3.6E-01	2.9E-01	2.1E-01			
0446 858	3.3E-04	2.2E-04	0.0E-01	6.2E-06	0.0E-01	0.0E-01
ASSP 2	4.1E-01	3.9E+01	4.0E+01	5.2E+01	1.0E+01	6.7E+00
	1.8E+00	8.4E-01	8.1E-01	6.1E-01	4.1E-01	2.9E-01
	2.9E-01	2.3E-01	2.6E-01			
0447 1140	6.6E-04	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 2	5.3E-01	4.4E+01	3.2E+01	4.3E+01	4.5E+00	2.8E+00
	9.2E-01	5.6E-01	6.5E-01	4.2E-01	4.7E-01	3.4E-01
	3.6E-01	2.9E-01	2.6E-01			

0500 1039	9.5E-03	2.5E-03	9.1E-04	2.4E-05	4.9E-05	7.7E-05
ASSP 2	2.8E+00	4.1E+01	6.2E+01	2.3E+01	4.4E+00	3.1E+00
	1.5E+00	1.1E+00	1.1E+00	9.0E-01	8.8E-01	6.6E-01
	4.8E-01	4.3E-01	4.6E-01			
0501 1108	1.3E-02	3.1E-03	1.0E-03	1.4E-04	4.3E-05	6.9E-05
ASSP 2	1.7E+00	3.7E+01	5.9E+01	2.1E+01	5.0E+00	3.3E+00
	1.3E+00	1.2E+00	9.7E-01	7.7E-01	6.8E-01	7.0E-01
	5.4E-01	5.3E-01	4.1E-01			
0502 1108	1.3E-02	1.5E-03	5.6E-04	5.3E-05	1.4E-05	3.1E-05
ASSP 2	1.3E+00	3.7E+01	6.4E+01	2.0E+01	4.3E+00	2.6E+00
	1.1E+00	8.8E-01	9.2E-01	6.7E-01	5.4E-01	5.0E-01
	4.8E-01	3.9E-01	4.6E-01			
0515 2258	1.0E-02	1.5E-03	3.4E-04	1.8E-05	3.6E-05	0.0E-01
ASSP 2	4.4E+00	2.3E+01	1.5E+01	2.9E+00	8.2E-01	8.7E-01
	6.8E-01	6.7E-01	5.2E-01	5.5E-01	5.7E-01	3.6E-01
	4.8E-01	3.5E-01	3.6E-01			
0516 2597	1.8E-03	4.6E-04	8.6E-05	1.1E-05	0.0E-01	0.0E-01
ASSP 2	3.8E+00	1.9E+01	3.6E+00	1.0E+00	4.7E-01	5.9E-01
	4.2E-01	5.1E-01	5.3E-01	3.9E-01	4.4E-01	3.0E-01
	3.2E-01	3.2E-01	3.4E-01			
0517 2758	2.5E-03	5.6E-04	1.6E-04	2.4E-05	8.1E-06	0.0E-01
ASSP 2	3.7E+00	1.9E+01	2.2E+00	9.6E-01	5.3E-01	3.4E-01
	4.3E-01	3.2E-01	3.6E-01	4.1E-01	3.0E-01	2.5E-01
	2.7E-01	2.3E-01	2.3E-01			
0528 4058	2.6E-03	1.1E-04	2.3E-05	6.2E-06	0.0E-01	3.1E-06
ASSP 2	2.7E+00	1.5E+01	8.1E-01	3.2E-01	1.2E-01	1.9E-01
	1.2E-01	8.8E-02	1.5E-01	1.3E-01	1.4E-01	9.9E-02
	6.6E-02	8.8E-02	7.9E-02			
0529 4276	3.1E-04	1.0E-04	3.4E-05	0.0E-01	0.0E-01	0.0E-01
ASSP 2	2.2E+00	1.4E+01	8.4E-01	3.3E-01	2.4E-01	1.7E-01
	1.8E-01	1.2E-01	9.4E-02	1.2E-01	1.5E-01	8.8E-02
	1.1E-01	9.4E-02	1.5E-01			
0530 4785	2.5E-03	1.9E-04	0.0E-01	1.6E-05	0.0E-01	0.0E-01
ASSP 2	2.0E+00	1.3E+01	6.2E-01	3.7E-01	9.3E-02	1.7E-01
	1.2E-01	1.4E-01	1.8E-01	1.2E-01	1.8E-01	1.4E-01
	9.4E-02	5.5E-02	6.1E-02			

Fog 12. August 9 (Day 221) 1975

DAY 221 NUMBER DENSITY (NO./CC/MICRON)
HOUR VISBY 1ST LINE = DAP LINES 2,3&4 = ASSP

1700 9999	6.7E-01	1.1E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	5.1E+01	4.5E+01	3.6E+01	1.8E+01	8.3E+00	4.1E-01
	2.8E-01	1.2E-01	1.1E-01	9.6E-02	8.7E-02	6.1E-02
	6.9E-02	6.9E-02	6.1E-02			
1701 9999	3.6E-01	2.2E-02	0.0E-01	9.5E-04	0.0E-01	0.0E-01
ASSP 4	4.9E+01	4.5E+01	3.3E+01	1.3E+01	4.1E+00	1.1E-01
	4.1E-02	4.1E-02	2.8E-02	1.7E-02	3.5E-02	8.7E-03
	0.0E-01	1.7E-02	8.7E-03			
1702 4556	6.1E-01	1.3E-01	4.4E-03	1.2E-03	0.0E-01	0.0E-01
ASSP 4	5.7E+01	4.4E+01	3.4E+01	1.4E+01	4.7E+00	1.9E-01
	1.1E-01	4.1E-02	9.4E-03	4.3E-02	4.3E-02	2.6E-02
	6.1E-02	1.7E-02	1.7E-02			
1703 2792	4.3E-01	8.3E-02	1.9E-03	1.0E-03	6.9E-04	0.0E-01
ASSP 4	2.7E+01	5.2E+01	6.6E+01	6.3E+01	4.2E+01	1.1E+01
	8.5E+00	2.5E+00	4.8E-01	4.9E-01	4.1E-01	3.9E-01
	3.6E-01	3.0E-01	3.0E-01			
1704 1245	3.7E-01	5.8E-02	1.1E-02	2.0E-03	0.0E-01	0.0E-01
ASSP 4	5.9E+01	6.3E+01	6.9E+01	6.4E+01	5.3E+01	2.2E+01
	1.8E+01	6.2E+00	1.8E+00	1.6E+00	1.7E+00	1.4E+00
	1.2E+00	1.1E+00	1.1E+00			
1705 721	1.3E+00	1.4E-01	1.6E-02	9.4E-04	1.3E-03	4.7E-04
ASSP 4	1.9E+01	2.5E+01	3.5E+01	4.4E+01	4.8E+01	4.5E+01
	3.9E+01	1.9E+01	1.5E+01	1.4E+01	1.4E+01	1.1E+01
	8.8E+00	7.8E+00	6.7E+00			
1706 627	1.8E+00	2.3E-01	2.1E-02	3.0E-03	6.7E-04	9.8E-04
ASSP 4	7.7E+00	1.1E+01	2.1E+01	3.2E+01	3.9E+01	4.3E+01
	4.1E+01	2.3E+01	2.1E+01	1.9E+01	2.0E+01	1.8E+01
	1.6E+01	1.5E+01	1.3E+01			
1707 451	3.7E+00	4.2E-01	4.4E-02	0.0E-01	9.3E-04	6.8E-04
ASSP 4	8.3E+00	9.1E+00	1.6E+01	2.8E+01	3.5E+01	3.8E+01
	3.4E+01	2.3E+01	2.0E+01	1.7E+01	1.7E+01	1.7E+01
	1.6E+01	1.5E+01	1.4E+01			
1708 448	4.0E+00	5.1E-01	5.8E-02	4.5E-03	0.0E-01	0.0E-01
ASSP 4	3.5E+00	5.3E+00	1.2E+01	2.4E+01	3.6E+01	4.5E+01
	4.3E+01	2.7E+01	2.3E+01	2.1E+01	2.1E+01	2.0E+01
	1.9E+01	1.8E+01	1.7E+01			
1709 451	2.8E+00	4.2E-01	5.8E-02	0.0E-01	1.4E-03	5.2E-04
ASSP 4	4.7E+00	5.9E+00	1.0E+01	2.4E+01	4.3E+01	5.7E+01
	5.1E+01	3.3E+01	3.0E+01	2.4E+01	2.5E+01	2.3E+01
	1.8E+01	1.7E+01	1.6E+01			
1710 487	3.4E+00	5.8E-01	1.0E-01	3.8E-03	1.7E-03	6.3E-04
ASSP 4	1.7E+01	1.3E+01	1.7E+01	3.1E+01	5.0E+01	5.7E+01
	5.1E+01	3.1E+01	2.5E+01	2.2E+01	2.1E+01	1.8E+01
	1.5E+01	1.4E+01	1.3E+01			
1711 397	4.1E+00	6.9E-01	6.7E-02	1.2E-03	8.2E-04	6.1E-04
ASSP 4	2.9E+01	2.4E+01	3.0E+01	3.9E+01	4.7E+01	4.7E+01
	4.4E+01	2.6E+01	2.3E+01	1.9E+01	1.8E+01	1.7E+01
	1.6E+01	1.5E+01	1.4E+01			

1713	385	2.8E+00	5.2E-01	6.2E-02	0.0E-01	6.7E-04	0.0E-01
ASSP 1		3.3E-02	9.7E-01	5.1E+00	7.3E+00	6.7E+00	6.1E+00
		4.4E+00	3.7E+00	2.5E+00	1.8E+00	1.1E+00	6.6E-01
		3.3E-01	1.9E-01	1.1E-01			
1714	368	5.3E+00	1.1E+00	1.4E-01	5.6E-03	0.0E-01	0.0E-01
ASSP 1		1.3E-02	5.1E-01	5.1E+00	8.3E+00	8.1E+00	7.3E+00
		4.9E+00	4.3E+00	3.1E+00	2.1E+00	1.3E+00	6.3E-01
		4.0E-01	2.1E-01	1.1E-01			
1715	422	5.3E+00	7.9E-01	1.6E-01	4.9E-03	4.4E-03	8.0E-04
ASSP 2		2.1E-01	9.8E-01	3.6E+00	5.9E+00	1.2E+01	1.3E+01
		1.6E+01	1.9E+01	1.9E+01	1.6E+01	1.5E+01	1.2E+01
		1.1E+01	9.0E+00	8.5E+00			
1716	474	5.1E+00	1.1E+00	1.7E-01	1.3E-02	1.1E-03	8.1E-04
ASSP 2		1.3E-01	9.9E-01	3.2E+00	5.8E+00	1.1E+01	1.0E+01
		1.3E+01	1.5E+01	1.5E+01	1.4E+01	1.3E+01	1.0E+01
		9.0E+00	7.4E+00	7.3E+00			
1718	481	3.2E+00	7.4E-01	8.8E-02	5.5E-03	1.8E-03	0.0E-01
ASSP 4		4.7E+01	3.0E+01	3.7E+01	4.4E+01	5.3E+01	4.9E+01
		3.8E+01	1.8E+01	1.5E+01	1.3E+01	1.2E+01	1.1E+01
		9.2E+00	9.0E+00	8.1E+00			
1719	458	2.8E+00	4.5E-01	6.2E-02	0.0E-01	1.5E-03	0.0E-01
ASSP 3		6.5E-02	1.4E+00	8.4E+00	8.0E+00	9.6E+00	9.1E+00
		7.9E+00	7.5E+00	6.3E+00	5.1E+00	4.2E+00	3.1E+00
		2.5E+00	1.7E+00	1.3E+00			
1720	513	5.9E+00	8.7E-01	2.0E-01	4.1E-03	2.8E-03	0.0E-01
ASSP 3		5.2E-02	1.4E+00	8.3E+00	9.8E+00	1.1E+01	1.1E+01
		8.6E+00	7.2E+00	6.1E+00	4.8E+00	3.8E+00	2.8E+00
		2.1E+00	1.6E+00	1.1E+00			
1722	335	3.5E+00	5.8E-01	8.2E-02	2.7E-03	9.1E-04	0.0E-01
ASSP 1		2.0E-02	7.9E-01	9.3E+00	1.3E+01	1.1E+01	8.1E+00
		5.5E+00	4.3E+00	2.7E+00	1.8E+00	1.0E+00	6.0E-01
		3.6E-01	1.7E-01	7.8E-02			
1723	441	4.1E+00	9.5E-01	1.7E-01	8.0E-03	1.1E-03	2.4E-03
ASSP 1		1.3E-02	4.9E-01	1.0E+01	1.4E+01	1.2E+01	8.7E+00
		5.9E+00	4.5E+00	3.2E+00	1.9E+00	1.3E+00	6.7E-01
		3.9E-01	2.2E-01	1.1E-01			
1724	454	5.5E+00	9.6E-01	1.6E-01	1.7E-02	1.2E-03	1.7E-03
ASSP 1		1.0E-02	4.2E-01	7.0E+00	1.0E+01	1.0E+01	7.9E+00
		5.6E+00	4.5E+00	3.1E+00	2.0E+00	1.2E+00	7.2E-01
		4.0E-01	2.1E-01	9.6E-02			

1725	359	5.0E+00	8.0E-01	1.3E-01	6.4E-03	0.0E-01	8.0E-04
ASSP 3		5.2E-02	3.0E-01	4.3E+00	9.0E+00	1.4E+01	1.4E+01
		1.0E+01	8.5E+00	6.7E+00	4.9E+00	4.0E+00	3.1E+00
		2.1E+00	1.8E+00	1.4E+00			
1726	284	5.9E+00	8.5E-01	1.3E-01	1.0E-02	2.3E-03	1.7E-03
ASSP 3		4.8E-02	5.2E-01	5.4E+00	1.0E+01	1.6E+01	1.5E+01
		1.2E+01	9.2E+00	7.6E+00	5.8E+00	4.3E+00	3.6E+00
		2.7E+00	2.2E+00	1.6E+00			
1727	314	5.5E+00	8.5E-01	1.6E-01	9.0E-03	3.0E-03	2.2E-03
ASSP 3		7.8E-02	4.6E-01	4.3E+00	1.0E+01	1.8E+01	1.8E+01
		1.4E+01	1.1E+01	9.4E+00	7.0E+00	5.8E+00	4.7E+00
		3.5E+00	3.0E+00	2.4E+00			
1728	389	4.0E+00	7.2E-01	1.0E-01	1.7E-02	7.5E-04	0.0E-01
ASSP 4		1.2E+01	1.1E+01	1.5E+01	3.2E+01	5.1E+01	6.3E+01
		5.0E+01	2.6E+01	2.3E+01	2.0E+01	1.9E+01	1.7E+01
		1.5E+01	1.4E+01	1.4E+01			
1729	440	4.5E+00	8.1E-01	1.6E-01	3.7E-03	1.6E-03	1.2E-03
ASSP 4		1.2E+01	1.1E+01	1.7E+01	3.7E+01	6.4E+01	7.3E+01
		5.5E+01	2.6E+01	2.1E+01	1.7E+01	1.5E+01	1.2E+01
		9.9E+00	9.2E+00	9.2E+00			
1730	407	4.2E+00	6.4E-01	7.3E-02	2.8E-03	3.7E-03	0.0E-01
ASSP 1		1.5E-02	8.6E-01	4.6E+00	7.5E+00	7.3E+00	6.6E+00
		4.2E+00	3.2E+00	2.3E+00	1.3E+00	8.0E-01	4.9E-01
		2.8E-01	1.7E-01	6.5E-02			
1731	348	2.8E+00	7.0E-01	9.4E-02	3.1E-03	2.1E-03	0.0E-01
ASSP 1		1.3E-02	7.5E-01	4.6E+00	6.8E+00	7.9E+00	7.0E+00
		4.9E+00	4.0E+00	2.8E+00	1.8E+00	1.1E+00	7.2E-01
		3.3E-01	1.9E-01	1.1E-01			
1732	315	3.9E+00	7.9E-01	1.5E-01	1.1E-02	2.7E-03	6.5E-04
ASSP 1		7.6E-03	2.0E-01	4.4E+00	8.0E+00	9.8E+00	8.6E+00
		6.2E+00	4.8E+00	3.5E+00	2.4E+00	1.6E+00	1.0E+00
		5.3E-01	3.3E-01	1.7E-01			
1733	335	4.5E+00	9.2E-01	1.0E-01	1.1E-02	1.9E-03	0.0E-01
ASSP 1		1.0E-02	1.9E-01	4.1E+00	8.4E+00	1.1E+01	9.1E+00
		6.4E+00	4.9E+00	3.2E+00	2.1E+00	1.4E+00	7.7E-01
		4.3E-01	2.5E-01	1.3E-01			
1734	315	5.3E+00	9.1E-01	1.4E-01	1.1E-02	4.2E-03	7.8E-04
ASSP 2		2.1E-01	1.4E+00	4.0E+00	6.9E+00	1.2E+01	1.3E+01
		1.5E+01	1.8E+01	1.8E+01	1.6E+01	1.7E+01	1.3E+01
		1.1E+01	1.0E+01	1.0E+01			
1735	333	3.5E+00	6.9E-01	1.2E-01	4.7E-03	0.0E-01	0.0E-01
ASSP 2		2.8E-01	1.4E+00	4.7E+00	8.0E+00	1.3E+01	1.3E+01
		1.6E+01	1.7E+01	1.8E+01	1.6E+01	1.6E+01	1.2E+01
		1.1E+01	9.8E+00	9.7E+00			

1736 322	4.8E+00	7.6E-01	1.7E-01	9.3E-03	2.7E-03	6.6E-04
ASSP 4	9.4E+01	5.0E+01	4.6E+01	5.8E+01	7.3E+01	7.1E+01
	5.3E+01	2.4E+01	2.0E+01	1.6E+01	1.6E+01	1.3E+01
	1.2E+01	1.1E+01	1.0E+01			
1737 323	4.1E+00	9.4E-01	2.3E-01	1.9E-02	7.2E-03	6.6E-04
ASSP 4	6.0E+01	4.1E+01	4.1E+01	5.4E+01	7.0E+01	7.2E+01
	5.5E+01	2.4E+01	2.0E+01	1.6E+01	1.6E+01	1.4E+01
	1.1E+01	1.1E+01	1.1E+01			
1738 318	5.1E+00	9.3E-01	2.2E-01	1.0E-02	1.9E-03	0.0E-01
ASSP 1	9.7E-01	1.7E+00	3.3E+00	5.7E+00	7.3E+00	8.5E+00
	6.7E+00	4.3E+00	3.4E+00	3.2E+00	3.0E+00	2.6E+00
	2.4E+00	2.4E+00	2.1E+00			
1739 410	5.4E+00	8.8E-01	1.8E-01	6.6E-03	1.8E-03	0.0E-01
ASSP 1	5.1E-03	1.1E-01	2.3E+00	5.6E+00	8.3E+00	9.1E+00
	6.4E+00	5.4E+00	3.9E+00	2.8E+00	1.8E+00	1.3E+00
	7.6E-01	4.5E-01	3.0E-01			
1740 396	4.2E+00	7.7E-01	1.5E-01	4.1E-03	4.6E-03	6.8E-04
ASSP 1	2.3E-02	7.7E-01	2.3E+00	4.8E+00	6.5E+00	6.9E+00
	5.2E+00	4.5E+00	3.2E+00	2.2E+00	1.6E+00	1.1E+00
	6.3E-01	3.7E-01	2.0E-01			
1741 316	4.1E+00	7.7E-01	1.7E-01	7.9E-03	4.2E-03	1.6E-03
ASSP 3	8.3E-02	8.3E-01	6.2E+00	5.1E+00	7.1E+00	8.2E+00
	7.5E+00	7.4E+00	6.7E+00	5.1E+00	4.3E+00	3.5E+00
	2.8E+00	2.1E+00	1.7E+00			
1742 286	5.2E+00	9.5E-01	2.1E-01	1.6E-02	4.4E-03	1.6E-03
ASSP 3	4.3E-02	7.6E-01	6.9E+00	5.1E+00	7.0E+00	8.5E+00
	8.2E+00	7.5E+00	7.1E+00	5.6E+00	4.8E+00	4.1E+00
	3.1E+00	2.6E+00	2.0E+00			
1743 261	8.4E+00	1.7E+00	3.5E-01	1.2E-02	4.2E-03	0.0E-01
ASSP 3	7.8E-02	4.6E-01	3.2E+00	4.0E+00	7.3E+00	9.8E+00
	9.9E+00	9.5E+00	8.5E+00	7.1E+00	5.9E+00	4.8E+00
	3.8E+00	3.1E+00	2.5E+00			
1754 307	4.8E+00	9.8E-01	1.3E-01	4.1E-03	2.8E-03	6.9E-04
ASSP 3	4.8E-02	3.3E-01	2.5E+00	4.0E+00	8.2E+00	1.2E+01
	1.1E+01	1.1E+01	9.6E+00	7.6E+00	5.9E+00	4.3E+00
	3.0E+00	2.3E+00	1.5E+00			
1755 306	5.3E+00	1.0E+00	9.7E-02	1.4E-03	2.8E-03	6.9E-04
ASSP 3	6.9E-02	6.9E-01	5.9E+00	7.7E+00	1.3E+01	1.3E+01
	1.2E+01	1.1E+01	8.5E+00	6.3E+00	4.6E+00	3.3E+00
	2.3E+00	1.7E+00	1.0E+00			
1756 308	5.5E+00	8.7E-01	8.5E-02	5.4E-03	9.2E-04	1.4E-03
ASSP 3	7.4E-02	5.0E-01	4.5E+00	6.3E+00	1.1E+01	1.4E+01
	1.2E+01	1.1E+01	8.7E+00	6.4E+00	4.6E+00	3.2E+00
	2.2E+00	1.5E+00	1.1E+00			

2300 270	1.4E+01	3.3E+00	6.1E-01	2.2E-02	5.1E-03	1.4E-03
ASSP 1	1.0E-02	1.3E-01	4.3E+00	1.1E+01	1.4E+01	1.1E+01

1757 520	6.3E+00	9.4E-01	8.2E-02	1.0E-02	8.5E-04	6.3E-04
ASSP 4	3.1E+01	2.9E+01	3.2E+01	4.9E+01	6.4E+01	6.3E+01
	4.6E+01	2.0E+01	1.8E+01	1.5E+01	1.3E+01	1.1E+01.
	9.5E+00	9.0E+00	8.7E+00			
1758 338	3.3E+00	6.9E-01	7.2E-02	5.8E-03	2.9E-03	7.2E-04
ASSP 4	4.2E+01	4.0E+01	5.0E+01	5.8E+01	7.3E+01	6.8E+01
	4.2E+01	1.6E+01	1.4E+01	1.1E+01	1.0E+01	8.7E+00
	7.8E+00	8.0E+00	7.8E+00			
1759 409	3.7E+00	8.5E-01	9.2E-02	2.6E-03	2.6E-03	6.5E-04
ASSP 4	3.8E+01	3.2E+01	3.8E+01	5.4E+01	6.9E+01	6.9E+01
	4.6E+01	2.4E+01	2.2E+01	1.6E+01	1.3E+01	9.6E+00
	8.3E+00	7.7E+00	7.4E+00			
1800 400	6.6E+00	9.6E-01	1.4E-01	1.0E-02	2.0E-03	7.4E-04
ASSP 1	1.5E-02	3.5E-01	3.7E+00	6.9E+00	9.5E+00	8.9E+00
	6.1E+00	4.6E+00	2.7E+00	1.6E+00	8.7E-01	4.8E-01
	2.4E-01	1.3E-01	6.7E-02			
1801 344	4.3E+00	9.0E-01	1.0E-01	2.7E-03	0.0E-01	1.3E-03
ASSP 1	1.8E-02	8.6E-01	4.0E+00	6.7E+00	8.6E+00	7.4E+00
	5.2E+00	3.7E+00	2.1E+00	1.2E+00	7.1E-01	3.3E-01
	1.5E-01	8.5E-02	3.9E-02			
1802 369	3.4E+00	6.9E-01	8.8E-02	4.1E-03	2.8E-03	1.4E-03
ASSP 1	1.8E-02	5.9E-01	5.1E+00	7.4E+00	9.2E+00	7.3E+00
	4.7E+00	3.2E+00	2.0E+00	1.0E+00	6.1E-01	3.1E-01
	1.9E-01	8.3E-02	6.1E-02			
1803 471	4.2E+00	7.2E-01	8.3E-02	8.7E-03	2.9E-03	7.2E-04
ASSP 1	2.5E-02	2.0E+00	4.8E+00	6.7E+00	8.7E+00	7.0E+00
	4.6E+00	3.3E+00	1.9E+00	1.0E+00	6.2E-01	2.8E-01
	1.2E-01	5.5E-02	2.0E-02			
1804 547	2.7E+00	5.3E-01	4.8E-02	2.9E-03	9.9E-04	7.3E-04
ASSP 2	2.4E-01	1.4E+01	2.3E+01	2.8E+01	2.3E+01	1.7E+01
	1.1E+01	6.7E+00	4.0E+00	1.9E+00	1.2E+00	4.3E-01
	2.4E-01	1.1E-01	9.1E-02			
1805 500	2.8E+00	4.2E-01	3.7E-02	3.0E-03	0.0E-01	0.0E-01
ASSP 2	3.1E-01	2.2E+00	2.5E+01	3.5E+01	2.1E+01	2.0E+01
	1.9E+01	1.6E+01	1.4E+01	1.2E+01	1.1E+01	7.7E+00
	6.6E+00	6.3E+00	5.6E+00			
1806 584	3.5E+00	4.6E-01	3.0E-02	2.8E-03	1.9E-03	7.1E-04
ASSP 2	3.3E-01	2.3E+00	2.7E+01	3.6E+01	2.9E+01	3.0E+01
	2.4E+01	1.5E+01	1.1E+01	9.6E+00	8.5E+00	5.7E+00
	5.2E+00	4.9E+00	4.2E+00			

0013 439	5.8E+00	1.8E+00	2.4E-01	4.9E-03	0.0E-01	0.0E-01

1807 591	3.4E+00	4.8E-01	8.3E-02	3.0E-03	0.0E-01	0.0E-01
ASSP 3	2.4E-01	5.1E+00	1.3E+01	1.1E+01	1.3E+01	9.7E+00
	7.7E+00	5.8E+00	4.3E+00	2.9E+00	1.9E+00	1.3E+00
	8.1E-01	6.0E-01	3.9E-01			
1808 562	3.8E+00	5.2E-01	3.6E-02	3.2E-03	1.1E-03	1.6E-03
ASSP 3	2.3E-01	5.2E+00	1.3E+01	1.1E+01	1.3E+01	1.1E+01
	8.2E+00	6.2E+00	4.2E+00	2.7E+00	1.8E+00	1.1E+00
	6.6E-01	4.0E-01	2.4E-01			
1809 610	3.2E+00	5.2E-01	3.8E-02	1.5E-03	1.0E-03	0.0E-01
ASSP 3	2.4E-01	3.4E+00	1.1E+01	1.2E+01	1.5E+01	1.2E+01
	8.9E+00	6.9E+00	4.8E+00	2.9E+00	1.7E+00	1.2E+00
	6.1E-01	4.4E-01	2.6E-01			
1810 550	3.1E+00	3.7E-01	1.6E-02	0.0E-01	2.3E-03	0.0E-01
ASSP 3	3.2E-01	4.8E+00	9.5E+00	8.5E+00	1.1E+01	9.1E+00
	6.6E+00	5.2E+00	3.6E+00	2.3E+00	1.2E+00	7.0E-01
	3.4E-01	2.2E-01	8.2E-02			
1811 643	4.6E+00	5.0E-01	1.7E-02	1.8E-03	1.2E-03	9.1E-04
ASSP 3	1.2E-01	4.3E+00	1.2E+01	1.2E+01	1.3E+01	1.1E+01
	8.7E+00	7.1E+00	5.1E+00	3.2E+00	2.0E+00	1.2E+00
	7.4E-01	4.5E-01	2.2E-01			
1812 742	2.7E+00	3.6E-01	9.8E-03	1.3E-03	2.6E-03	1.3E-03
ASSP 3	2.0E-01	7.3E+00	1.4E+01	1.2E+01	1.2E+01	1.1E+01
	7.9E+00	6.2E+00	4.3E+00	2.6E+00	1.4E+00	8.0E-01
	4.3E-01	2.3E-01	1.2E-01			
1813 1001	2.5E+00	3.4E-01	7.7E-03	5.4E-03	2.7E-03	0.0E-01
ASSP 3	6.2E-01	9.8E+00	1.7E+01	1.0E+01	1.0E+01	7.9E+00
	5.9E+00	4.5E+00	3.1E+00	1.9E+00	1.0E+00	6.1E-01
	3.9E-01	2.6E-01	1.0E-01			
1814 1015	2.0E+00	3.6E-01	9.0E-03	1.2E-03	0.0E-01	0.0E-01
ASSP 3	2.1E+00	1.4E+01	2.0E+01	6.9E+00	6.4E+00	4.6E+00
	3.5E+00	2.5E+00	1.8E+00	1.3E+00	7.3E-01	3.9E-01
	2.5E-01	1.3E-01	5.2E-02			
1815 2067	1.5E+00	1.6E-01	9.2E-03	2.4E-03	0.0E-01	1.2E-03
ASSP 3	4.0E+00	1.3E+01	1.1E+01	5.9E+00	4.4E+00	3.4E+00
	2.2E+00	1.7E+00	1.1E+00	6.7E-01	4.3E-01	2.6E-01
	1.3E-01	1.3E-01	7.6E-02			
1816 2084	1.1E+00	1.3E-01	7.2E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.4E+00	8.3E+00	2.7E+00	1.8E+00	1.5E+00	1.1E+00
	7.5E-01	5.6E-01	3.2E-01	2.2E-01	1.1E-01	5.2E-02
	3.6E-02	1.5E-02	3.0E-03			
1817 1588	1.0E+00	1.8E-01	2.7E-03	1.4E-03	9.4E-04	0.0E-01
ASSP 3	4.2E+00	6.5E+00	2.1E+00	2.0E+00	2.0E+00	1.6E+00
	1.3E+00	9.8E-01	7.2E-01	4.1E-01	2.0E-01	8.5E-02
	6.4E-02	2.7E-02	1.5E-02			
1818 1210	1.4E+00	2.1E-01	1.2E-02	3.7E-03	8.4E-04	1.9E-03
ASSP 3	9.6E+00	1.3E+01	6.1E+00	2.6E+00	2.0E+00	1.4E+00
	1.2E+00	8.5E-01	4.8E-01	2.8E-01	1.6E-01	7.6E-02
	2.1E-02	2.7E-02	1.5E-02			
1819 1048	1.8E+00	2.4E-01	9.4E-03	1.2E-03	2.5E-03	6.1E-04
ASSP 3	4.3E+00	1.2E+01	1.4E+01	8.1E+00	7.1E+00	3.6E+00
	2.4E+00	1.5E+00	1.0E+00	6.2E-01	3.8E-01	1.6E-01
	8.5E-02	6.4E-02	3.0E-02			

0032 297	5.7E+00	1.9E+00	4.4E-01	1.2E-02	7.4E-04	0.0E-01
ASSP 4	1.7E+02	1.4E+02	1.1E+02	6.2E+01	5.7E+01	3.0E+01
	1.6E+01	1.2E+01	1.0E+01	8.4E+00	8.0E+00	7.6E+00
	6.6E+00	7.1E+00	[illegible]			

1820 1981	1.0E+00	2.1E-01	9.3E-03	0.0E-01	1.7E-03	0.0E-01
ASSP 3	5.5E+00	1.9E+01	2.0E+01	5.9E+00	4.3E+00	2.2E+00
	1.4E+00	1.0E+00	5.4E-01	3.6E-01	1.9E-01	1.2E-01
	7.3E-02	4.6E-02	2.7E-02			
1821 1650	8.7E-01	2.6E-01	7.2E-03	6.3E-03	2.6E-03	6.3E-04
ASSP 3	3.4E+00	8.5E+00	8.4E+00	3.8E+00	3.3E+00	1.7E+00
	9.9E-01	5.9E-01	3.8E-01	2.4E-01	1.2E-01	9.1E-02
	4.0E-02	2.4E-02	9.1E-03			
1822 1754	1.8E+00	1.8E-01	4.7E-03	3.7E-03	2.5E-03	6.1E-04
ASSP 3	7.1E+00	1.5E+01	1.2E+01	3.9E+00	2.6E+00	1.4E+00
	7.4E-01	4.6E-01	3.6E-01	2.3E-01	8.5E-02	6.1E-02
	4.9E-02	2.4E-02	1.2E-02			
1823 1363	1.7E+00	2.3E-01	2.6E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.4E+00	1.3E+01	1.1E+01	3.9E+00	2.8E+00	1.5E+00
	8.8E-01	6.5E-01	3.7E-01	2.2E-01	1.2E-01	9.1E-02
	5.2E-02	2.7E-02	9.1E-03			
1824 2655	2.1E+00	2.2E-01	2.6E-03	1.4E-03	9.2E-04	6.8E-04
ASSP 3	5.9E+00	1.1E+01	8.8E+00	3.2E+00	1.9E+00	1.1E+00
	6.3E-01	3.9E-01	2.6E-01	1.4E-01	7.0E-02	6.4E-02
	2.1E-02	1.2E-02	9.1E-03			
1825 3539	8.8E-01	1.3E-01	2.4E-03	0.0E-01	0.0E-01	6.3E-04
ASSP 3	7.4E+00	7.2E+00	2.2E+00	8.1E-01	6.1E-01	2.0E-01
	1.7E-01	1.2E-01	7.0E-02	4.3E-02	6.1E-03	1.2E-02
	9.1E-03	0.0E-01	0.0E-01			
1826 4153	6.6E-01	3.6E-02	3.0E-03	0.0E-01	3.2E-03	0.0E-01
ASSP 3	7.9E+00	6.5E+00	1.8E+00	6.1E-01	5.3E-01	2.4E-01
	1.5E-01	1.2E-01	8.5E-02	5.8E-02	1.2E-02	1.2E-02
	3.0E-03	9.1E-03	6.1E-03			
1827 1935	4.9E-01	6.3E-02	5.8E-03	1.5E-03	1.0E-03	7.6E-04
ASSP 3	6.2E+00	5.6E+00	1.4E+00	2.3E-01	1.3E-01	9.7E-02
	9.6E-02	2.7E-02	2.4E-02	2.1E-02	1.5E-02	3.0E-03
	0.0E-01	0.0E-01	3.0E-03			
1828 1148	1.2E+00	1.9E-01	5.6E-03	0.0E-01	9.9E-04	1.5E-03
ASSP 3	1.1E+01	1.3E+01	6.4E+00	1.8E+00	1.3E+00	6.2E-01
	4.3E-01	3.8E-01	3.3E-01	1.6E-01	1.3E-01	6.7E-02
	2.7E-02	2.4E-02	6.1E-03			
1829 3189	1.6E+00	2.5E-01	3.1E-03	3.3E-03	4.4E-03	2.4E-03
ASSP 3	6.1E+00	1.7E+01	1.4E+01	4.6E+00	2.8E+00	1.6E+00
	1.1E+00	7.8E-01	4.5E-01	2.6E-01	1.6E-01	8.2E-02
	3.6E-02	3.0E-03	6.1E-03			
1830 2897	1.6E+00	1.7E-01	2.6E-03	4.1E-03	0.0E-01	6.9E-04
ASSP 3	7.0E+00	9.7E+00	2.5E+00	8.9E-01	5.6E-01	3.4E-01
	2.8E-01	1.4E-01	7.3E-02	3.0E-02	1.5E-02	2.1E-02
	9.1E-03	0.0E-01	0.0E-01			

0044 378 3.7E+00 1.4E+00 3.0E-01 4.4E-03 7.4E-04 0.0E-01

1832 4797	1.4E+00	1.1E-01	3.1E-03	3.2E-03	4.4E-03	2.4E-03
ASSP 3	4.2E+00	2.6E+00	2.4E-01	9.0E-02	4.0E-02	1.4E-02
	1.4E-02	3.0E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1833 4472	8.4E-01	1.5E-01	2.7E-03	0.0E-01	9.7E-04	1.4E-03
ASSP 3	2.0E+00	1.7E+00	2.4E-01	6.9E-02	2.7E-02	1.4E-02
	8.7E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
	3.0E-03	0.0E-01	3.0E-03			
1834 3158	1.3E+00	1.2E-01	2.8E-03	1.5E-03	1.0E-03	0.0E-01
ASSP 3	7.8E+00	8.7E+00	2.9E+00	5.0E-01	2.3E-01	2.0E-01
	1.2E-01	1.3E-01	7.3E-02	4.3E-02	2.4E-02	3.0E-03
	3.0E-03	0.0E-01	6.1E-03			
1835 5524	4.0E-01	1.6E-01	5.7E-03	0.0E-01	0.0E-01	1.5E-03
ASSP 3	1.1E+00	9.5E-01	1.1E-01	3.8E-02	2.4E-02	8.3E-03
	2.9E-03	6.1E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1836 5186	1.5E+00	2.1E-01	3.2E-03	1.7E-03	3.4E-03	8.3E-04
ASSP 3	1.0E+00	7.5E-01	8.7E-02	2.0E-02	9.1E-03	2.8E-03
	2.9E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1837 6056	2.5E+00	3.1E-01	0.0E-01	0.0E-01	1.3E-03	0.0E-01
ASSP 3	9.8E-01	8.6E-01	9.3E-02	2.6E-02	6.1E-03	2.8E-03
	5.8E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1838 6341	2.5E+00	2.3E-01	2.8E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	8.0E-01	6.5E-01	5.2E-02	1.2E-02	3.0E-03	2.8E-03
	0.0E-01	0.0E-01	3.0E-03	3.0E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1839 6977	1.8E+00	2.3E-01	3.6E-03	0.0E-01	1.3E-03	0.0E-01
ASSP 3	4.9E-01	4.0E-01	5.8E-02	1.7E-02	6.1E-03	0.0E-01
	2.9E-03	6.1E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
1840 6655	1.1E+00	2.8E-01	2.5E-03	1.3E-03	2.7E-03	0.0E-01
ASSP 3	5.1E-01	3.4E-01	7.8E-02	1.7E-02	0.0E-01	2.8E-03
	0.0E-01	0.0E-01	0.0E-01	3.0E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			

Fog 13. August 10 (Day 222) 1975

DAY 222 HOUR VSBY	NUMBER DENSITY (NO./CC/MICRON) 1ST LINE = DAP LINES 2,3&4 = ASSP					
1640 9999	1.2E-01	1.3E-02	0.0E-01	7.2E-04	0.0E-01	0.0E-01
ASSP 4	4.5E+01	4.7E+01	3.0E+01	1.3E+01	7.2E+00	8.0E-01
	2.0E-01	1.0E-01	3.7E-02	1.7E-02	3.5E-02	4.3E-02
	8.7E-03	8.7E-03	8.7E-03			
1641 9999	2.1E-01	7.8E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	4.7E+01	3.4E+01	1.8E+01	9.0E+00	5.1E-01
	2.2E-01	1.3E-01	4.7E-02	1.7E-02	2.6E-02	2.6E-02
	8.7E-03	0.0E-01	0.0E-01			
1642 9974	2.3E-01	1.4E-02	0.0E-01	6.1E-04	0.0E-01	0.0E-01
ASSP 4	7.6E+01	7.2E+01	5.3E+01	2.9E+01	1.7E+01	7.8E-01
	4.6E-01	1.8E-01	2.8E-02	2.6E-02	5.2E-02	3.5E-02
	8.7E-03	0.0E-01	0.0E-01			
1643 6555	1.3E-01	1.4E-02	0.0E-01	8.3E-04	5.6E-04	0.0E-01
ASSP 4	2.9E+01	7.9E+01	1.1E+02	9.9E+01	7.9E+01	1.1E+01
	2.5E+00	1.1E+00	4.4E-01	1.8E-01	2.2E-01	9.6E-02
	1.7E-01	8.7E-02	1.7E-01			
1645 9353	2.9E-01	3.6E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.9E+01	8.6E+01	8.4E+01	5.3E+01	3.3E+01	2.1E+00
	5.7E-01	1.8E-01	6.5E-02	4.3E-02	2.6E-02	2.6E-02
	2.6E-02	8.7E-03	1.7E-02			
1646 2490	2.9E-01	4.1E-03	1.3E-03	0.0E-01	0.0E-01	3.4E-04
ASSP 4	7.9E+01	8.9E+01	8.5E+01	6.6E+01	5.3E+01	1.1E+01
	6.1E+00	3.5E+00	1.2E+00	6.9E-01	5.0E-01	6.5E-01
	5.7E-01	3.6E-01	4.3E-01			
1647 1758	9.8E-02	2.1E-02	1.2E-03	1.2E-03	0.0E-01	0.0E-01
ASSP 4	1.2E+00	2.1E+01	6.9E+01	9.1E+01	1.2E+02	7.8E+01
	5.9E+01	2.5E+01	1.1E+01	4.0E+00	3.8E+00	3.1E+00
	2.7E+00	2.0E+00	1.6E+00			
1648 1469	1.5E-01	4.5E-02	2.7E-03	1.4E-03	0.0E-01	0.0E-01
ASSP 4	1.9E+00	1.8E+01	5.8E+01	8.3E+01	1.1E+02	7.6E+01
	6.8E+01	2.9E+01	9.9E+00	5.1E+00	4.6E+00	4.2E+00
	3.0E+00	2.4E+00	2.2E+00			
1649 973	5.8E-01	3.8E-02	4.9E-03	0.0E-01	4.4E-04	0.0E-01
ASSP 4	1.6E+01	3.3E+01	7.1E+01	9.1E+01	1.2E+02	8.1E+01
	6.5E+01	2.8E+01	9.8E+00	6.7E+00	5.9E+00	5.3E+00
	4.6E+00	3.1E+00	3.2E+00			
1654 2306	3.5E-01	1.7E-02	1.4E-03	0.0E-01	4.9E-04	0.0E-01
ASSP 3	4.9E+00	1.8E+01	4.5E+00	3.9E+00	2.6E+00	1.6E+00
	8.0E-01	4.2E-01	2.4E-01	1.0E-01	4.6E-02	1.8E-02
	1.5E-02	0.0E-01	0.0E-01			
1655 2834	5.2E-01	2.0E-02	0.0E-01	1.4E-03	0.0E-01	0.0E-01
ASSP 3	6.0E-01	2.8E+00	5.7E-01	6.4E-01	5.3E-01	4.0E-01
	2.9E-01	2.2E-01	1.2E-01	5.5E-02	3.0E-02	9.1E-03
	3.0E-03	0.0E-01	0.0E-01			
1656 1149	3.9E-01	4.8E-02	3.1E-03	0.0E-01	5.5E-04	0.0E-01
ASSP 3	3.3E+00	1.6E+01	4.1E+00	4.1E+00	3.6E+00	3.1E+00
	2.0E+00	1.3E+00	8.7E-01	3.3E-01	1.4E-01	7.6E-02
	3.0E-02	9.1E-03	3.0E-03			

1657 862	4.4E-01	3.0E-02	9.7E-03	1.3E-03	0.0E-01	0.0E-01
ASSP 3	4.1E+00	2.3E+01	8.3E+00	6.0E+00	4.1E+00	3.1E+00
	1.8E+00	1.2E+00	6.7E-01	3.4E-01	1.6E-01	4.6E-02
	2.1E-02	9.1E-03	3.0E-03			
1658 716	1.0E+00	9.6E-02	1.2E-02	2.2E-03	9.7E-04	0.0E-01
ASSP 3	3.4E+00	2.1E+01	7.8E+00	7.3E+00	5.7E+00	4.6E+00
	3.0E+00	2.3E+00	1.2E+00	7.0E-01	5.3E-01	2.7E-01
	1.8E-01	1.3E-01	7.3E-02			
1659 555	2.5E+00	4.2E-01	3.4E-02	2.0E-03	4.6E-04	0.0E-01
ASSP 3	2.4E-01	8.4E+00	1.2E+01	1.4E+01	1.4E+01	1.2E+01
	8.0E+00	6.6E+00	5.1E+00	3.1E+00	2.3E+00	1.5E+00
	1.1E+00	7.7E-01	5.4E-01			
1700 1077	2.2E+00	2.5E-01	4.3E-02	2.0E-03	0.0E-01	0.0E-01
ASSP 3	1.0E+00	1.9E+01	1.2E+01	9.9E+00	7.6E+00	6.7E+00
	4.5E+00	3.9E+00	3.1E+00	2.1E+00	1.6E+00	1.1E+00
	7.4E-01	5.9E-01	3.2E-01			
1701 4493	2.2E-01	4.0E-02	6.5E-03	0.0E-01	4.6E-04	0.0E-01
ASSP 3	3.3E-01	2.5E+00	1.1E+00	1.1E+00	7.8E-01	7.5E-01
	5.5E-01	4.6E-01	4.4E-01	1.9E-01	2.0E-01	1.6E-01
	1.2E-01	8.8E-02	5.5E-02			
1702 5313	1.6E-01	4.3E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.6E-02	2.3E-01	1.1E-01	1.2E-01	1.2E-01	1.4E-01
	1.2E-01	7.3E-02	6.7E-02	5.2E-02	4.3E-02	3.6E-02
	2.4E-02	2.1E-02	1.2E-02			
1703 1736	5.4E-01	4.6E-02	4.4E-03	7.8E-04	0.0E-01	3.9E-04
ASSP 3	5.3E-01	5.2E+00	2.4E+00	2.3E+00	2.2E+00	1.8E+00
	1.2E+00	1.0E+00	7.2E-01	5.5E-01	4.4E-01	2.8E-01
	2.5E-01	1.5E-01	1.1E-01			
1704 1364	1.4E+00	1.5E-01	1.3E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.1E+00	1.7E+01	7.4E+00	7.1E+00	6.4E+00	5.4E+00
	3.4E+00	2.5E+00	2.0E+00	1.3E+00	8.8E-01	6.5E-01
	4.9E-01	2.9E-01	2.5E-01			
1705 1177	8.9E-01	1.5E-01	1.5E-02	0.0E-01	8.4E-04	0.0E-01
ASSP 3	4.8E+00	1.6E+01	6.3E+00	6.3E+00	5.6E+00	4.7E+00
	3.3E+00	2.6E+00	1.9E+00	1.3E+00	9.6E-01	6.8E-01
	5.2E-01	4.1E-01	2.0E-01			
1706 1682	4.6E-01	5.5E-02	7.1E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	3.0E+00	1.2E+01	3.8E+00	3.9E+00	3.9E+00	2.8E+00
	2.3E+00	1.9E+00	1.5E+00	9.3E-01	6.8E-01	4.6E-01
	3.6E-01	2.2E-01	1.9E-01			
1707 3368	3.4E-01	4.1E-02	4.9E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.5E-01	3.9E+00	1.3E+00	1.5E+00	1.5E+00	1.4E+00
	1.1E+00	8.1E-01	6.1E-01	5.1E-01	3.3E-01	2.7E-01
	2.2E-01	1.2E-01	9.7E-02			
1708 1628	9.4E-01	1.7E-01	2.6E-02	2.0E-03	0.0E-01	0.0E-01
ASSP 3	2.1E+00	1.2E+01	3.9E+00	4.2E+00	3.9E+00	3.4E+00
	2.5E+00	2.2E+00	1.6E+00	1.2E+00	8.7E-01	6.4E-01
	4.5E-01	3.9E-01	2.7E-01			
1709 1358	9.9E-01	1.6E-01	1.1E-02	0.0E-01	5.0E-04	3.7E-04
ASSP 3	4.1E+00	1.5E+01	5.2E+00	5.3E+00	4.9E+00	4.4E+00
	3.2E+00	2.6E+00	2.1E+00	1.5E+00	1.1E+00	9.2E-01
	7.2E-01	4.6E-01	3.0E-01			

1710 1282	1.1E+00	1.6E-01	4.0E-02	2.6E-03	0.0E-01	0.0E-01
ASSP 3	1.4E+00	1.4E+01	6.2E+00	6.5E+00	6.6E+00	6.3E+00
	4.2E+00	3.7E+00	2.8E+00	2.0E+00	1.5E+00	1.1E+00
	8.8E-01	6.9E-01	5.1E-01			
1711 884	1.7E+00	2.9E-01	5.4E-02	5.5E-03	1.9E-03	0.0E-01
ASSP 3	1.1E+00	8.6E+00	7.3E+00	7.0E+00	8.5E+00	7.2E+00
	5.7E+00	4.8E+00	3.7E+00	2.7E+00	2.1E+00	1.6E+00
	1.1E+00	8.4E-01	7.7E-01			
1712 2135	5.6E-01	8.8E-02	1.5E-02	1.3E-03	8.9E-04	0.0E-01
ASSP 3	1.8E+00	6.0E+00	1.5E+00	1.5E+00	1.9E+00	1.7E+00
	1.7E+00	1.4E+00	1.3E+00	9.7E-01	8.3E-01	7.1E-01
	5.3E-01	4.1E-01	2.9E-01			
1713 1450	8.9E-01	1.8E-01	2.0E-02	3.1E-03	1.0E-03	0.0E-01
ASSP 3	2.1E+00	6.7E+00	2.9E+00	2.8E+00	3.7E+00	2.9E+00
	2.8E+00	2.3E+00	2.1E+00	1.4E+00	1.2E+00	9.1E-01
	7.1E-01	5.7E-01	4.9E-01			
1714 794	2.1E+00	3.6E-01	6.0E-02	4.3E-03	1.2E-03	0.0E-01
ASSP 3	1.2E+00	8.2E+00	6.1E+00	7.7E+00	9.1E+00	8.7E+00
	6.5E+00	5.3E+00	3.8E+00	2.7E+00	1.9E+00	1.4E+00
	9.2E-01	7.1E-01	5.3E-01			
1715 775	1.8E+00	1.9E-01	2.7E-02	2.7E-03	0.0E-01	3.3E-04
ASSP 3	5.7E-01	8.0E+00	8.9E+00	7.9E+00	8.7E+00	7.5E+00
	5.7E+00	4.9E+00	3.6E+00	2.4E+00	1.7E+00	1.2E+00
	8.0E-01	6.2E-01	4.0E-01			
1716 1078	1.3E+00	2.0E-01	3.6E-02	2.1E-03	9.4E-04	0.0E-01
ASSP 3	2.1E+00	1.3E+01	8.2E+00	6.1E+00	6.6E+00	5.5E+00
	4.0E+00	3.4E+00	2.4E+00	1.6E+00	1.1E+00	8.1E-01
	5.6E-01	4.0E-01	3.1E-01			
1717 2447	4.3E-01	7.1E-02	7.7E-03	6.7E-04	0.0E-01	0.0E-01
ASSP 3	8.1E-01	3.5E+00	2.2E+00	2.8E+00	3.3E+00	3.1E+00
	2.3E+00	1.7E+00	1.4E+00	9.5E-01	6.6E-01	4.6E-01
	3.7E-01	1.8E-01	1.7E-01			
1718 3754	1.2E-01	4.7E-02	2.8E-03	7.3E-04	4.9E-04	3.6E-04
ASSP 3	4.1E-01	1.1E+00	9.8E-01	1.3E+00	1.1E+00	1.0E+00
	6.9E-01	5.5E-01	4.5E-01	2.8E-01	2.1E-01	1.9E-01
	7.0E-02	4.6E-02	5.8E-02			
1719 4716	1.6E-01	3.9E-02	1.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.4E-01	5.2E-01	5.1E-01	5.6E-01	6.2E-01	4.4E-01
	3.2E-01	2.7E-01	2.6E-01	1.6E-01	1.0E-01	7.9E-02
	3.3E-02	2.7E-02	3.6E-02			
1720 3736	3.4E-01	2.5E-02	1.3E-03	7.1E-04	0.0E-01	0.0E-01
ASSP 3	2.8E-01	5.5E-01	5.6E-01	5.9E-01	6.0E-01	4.3E-01
	3.2E-01	2.4E-01	1.7E-01	1.5E-01	1.2E-01	8.5E-02
	4.3E-02	4.6E-02	2.4E-02			
1721 5891	3.3E-01	3.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E-01	5.4E-01	6.1E-01	6.4E-01	6.4E-01	4.4E-01
	3.0E-01	2.6E-01	2.6E-01	1.4E-01	9.7E-02	6.7E-02
	4.0E-02	3.3E-02	3.6E-02			
1722 6667	1.5E-01	3.4E-02	1.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.0E-01	3.3E-01	2.3E-01	2.5E-01	2.5E-01	1.8E-01
	1.4E-01	1.1E-01	8.8E-02	5.8E-02	3.6E-02	3.6E-02
	1.5E-02	2.4E-02	1.5E-02			

1723 6270	1.5E-01	2.0E-02	0.0E-01	6.8E-04	0.0E-01	0.0E-01
ASSP 3	1.0E-01	1.9E-01	1.3E-01	1.5E-01	1.6E-01	1.3E-01
	1.0E-01	7.0E-02	5.8E-02	4.0E-02	2.7E-02	3.0E-02
	1.2E-02	1.2E-02	6.1E-03			
1724 5945	1.8E-01	2.4E-02	1.6E-03	8.3E-04	0.0E-01	0.0E-01
ASSP 3	7.8E-02	2.5E-01	7.1E-01	8.3E-01	1.0E+00	7.8E-01
	5.8E-01	4.4E-01	2.7E-01	1.9E-01	1.6E-01	8.8E-02
	5.2E-02	3.3E-02	2.1E-02			
1725 3700	1.1E-01	5.2E-02	5.2E-03	0.0E-01	4.6E-04	0.0E-01
ASSP 3	3.5E-01	1.4E+00	1.1E+00	1.1E+00	1.2E+00	9.9E-01
	7.6E-01	5.4E-01	3.2E-01	2.3E-01	1.7E-01	1.2E-01
	7.6E-02	7.6E-02	2.7E-02			
1726 3328	4.5E-01	6.3E-02	4.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.4E-01	2.0E+00	2.3E+00	2.5E+00	2.3E+00	1.8E+00
	1.2E+00	8.3E-01	5.5E-01	3.7E-01	2.7E-01	1.5E-01
	1.2E-01	6.7E-02	4.3E-02			
1727 6511	1.3E-01	3.2E-02	1.5E-03	7.9E-04	0.0E-01	0.0E-01
ASSP 3	2.2E-01	7.0E-01	7.9E-01	7.7E-01	7.9E-01	5.8E-01
	3.0E-01	2.6E-01	2.0E-01	1.3E-01	6.4E-02	4.6E-02
	3.3E-02	4.6E-02	1.5E-02			
1728 7647	1.1E-01	2.8E-02	0.0E-01	0.0E-01	0.0E-01	3.4E-04
ASSP 3	1.6E-01	2.0E-01	7.5E-02	3.5E-02	1.8E-02	1.9E-02
	5.8E-03	9.1E-03	1.2E-02	3.0E-03	0.0E-01	3.0E-03
	3.0E-03	3.0E-03	0.0E-01			
1729 8008	2.0E-01	2.2E-02	0.0E-01	7.4E-04	0.0E-01	0.0E-01
ASSP 3	1.1E-01	2.2E-01	7.8E-02	1.7E-02	3.0E-03	0.0E-01
	1.4E-02	6.1E-03	3.0E-03	6.1E-03	3.0E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
1730 7117	1.4E-01	1.2E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.9E-01	5.2E-01	2.4E-01	2.2E-01	2.2E-01	1.9E-01
	1.2E-01	8.2E-02	5.8E-02	6.1E-02	2.7E-02	2.7E-02
	1.2E-02	9.1E-03	1.2E-02			
1731 2516	4.0E-01	3.2E-02	6.4E-03	6.8E-04	0.0E-01	0.0E-01
ASSP 3	5.4E-01	1.9E+00	2.3E+00	2.7E+00	3.4E+00	2.7E+00
	1.8E+00	1.3E+00	9.1E-01	5.5E-01	3.3E-01	1.8E-01
	1.2E-01	5.8E-02	4.3E-02			
1732 2173	7.0E-01	8.4E-02	7.1E-03	6.3E-04	0.0E-01	0.0E-01
ASSP 3	7.3E-01	3.7E+00	5.0E+00	6.3E+00	6.9E+00	5.3E+00
	3.8E+00	2.8E+00	1.7E+00	1.0E+00	6.7E-01	3.7E-01
	2.5E-01	1.4E-01	7.0E-02			
1733 3223	2.5E-01	6.3E-02	9.0E-03	0.0E-01	4.6E-04	3.4E-04
ASSP 3	2.9E-01	1.5E+00	2.4E+00	2.7E+00	2.7E+00	2.2E+00
	1.5E+00	1.2E+00	7.7E-01	5.2E-01	3.2E-01	1.6E-01
	1.2E-01	6.4E-02	4.0E-02			
1734 4397	3.9E-02	3.0E-02	1.4E-03	0.0E-01	5.0E-04	0.0E-01
ASSP 3	4.0E-01	9.3E-01	6.4E-01	6.7E-01	7.3E-01	6.1E-01
	3.9E-01	3.1E-01	2.2E-01	1.6E-01	9.4E-02	7.3E-02
	5.5E-02	3.3E-02	2.4E-02			
1735 2312	4.3E-01	1.7E-02	2.8E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.5E+00	3.9E+00	1.2E+00	1.1E+00	1.1E+00	8.8E-01
	6.7E-01	4.9E-01	3.3E-01	2.4E-01	1.2E-01	7.9E-02
	6.4E-02	4.0E-02	2.1E-02			

1736 1571	4.6E-01	8.9E-02	5.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.2E+00	5.4E+00	3.5E+00	3.5E+00	3.3E+00	2.8E+00
	1.9E+00	1.5E+00	1.0E+00	6.3E-01	3.9E-01	2.3E-01
	1.5E-01	8.5E-02	6.1E-02			
1737 1160	1.0E+00	9.3E-02	4.1E-03	0.0E-01	4.9E-04	0.0E-01
ASSP 3	2.3E+00	1.1E+01	1.0E+01	9.1E+00	8.1E+00	5.6E+00
	3.0E+00	2.0E+00	1.1E+00	6.2E-01	3.6E-01	2.7E-01
	1.4E-01	7.3E-02	5.5E-02			
1738 2091	4.0E-01	5.6E-02	7.9E-03	1.4E-03	0.0E-01	0.0E-01
ASSP 3	2.6E+00	7.1E+00	3.8E+00	3.2E+00	2.8E+00	2.1E+00
	1.3E+00	8.6E-01	5.8E-01	3.3E-01	1.7E-01	1.6E-01
	1.1E-01	6.7E-02	2.1E-02			
1739 2561	4.0E-01	7.1E-02	4.3E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.0E+00	3.1E+00	2.7E+00	2.5E+00	2.8E+00	2.1E+00
	1.6E+00	1.1E+00	7.7E-01	5.3E-01	2.3E-01	1.5E-01
	1.0E-01	7.0E-02	3.6E-02			
1740 1085	1.3E+00	1.3E-01	5.5E-03	7.2E-04	0.0E-01	0.0E-01
ASSP 3	1.5E+00	4.5E+00	6.8E+00	6.4E+00	7.1E+00	5.2E+00
	3.8E+00	2.9E+00	1.8E+00	1.3E+00	8.5E-01	4.7E-01
	3.0E-01	1.8E-01	9.4E-02			
1741 1117	1.4E+00	2.0E-01	6.8E-03	1.4E-03	0.0E-01	0.0E-01
ASSP 3	2.0E+00	6.9E+00	4.9E+00	5.1E+00	6.5E+00	5.2E+00
	4.3E+00	3.0E+00	2.4E+00	1.6E+00	8.5E-01	5.5E-01
	3.1E-01	1.9E-01	8.2E-02			
1742 950	1.8E+00	3.1E-01	1.8E-02	2.0E-03	0.0E-01	0.0E-01
ASSP 3	2.1E+00	8.6E+00	7.9E+00	7.7E+00	9.5E+00	8.1E+00
	6.5E+00	5.1E+00	3.4E+00	2.2E+00	1.3E+00	6.9E-01
	4.5E-01	2.0E-01	1.6E-01			
1743 716	2.8E+00	3.5E-01	3.6E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.5E-01	3.7E+00	8.2E+00	8.7E+00	1.1E+01	9.9E+00
	7.9E+00	6.2E+00	4.3E+00	2.8E+00	1.5E+00	9.2E-01
	5.2E-01	3.0E-01	1.2E-01			
1744 757	2.2E+00	2.8E-01	2.6E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.1E-01	7.4E+00	1.0E+01	9.5E+00	1.1E+01	9.1E+00
	7.1E+00	5.1E+00	3.5E+00	2.2E+00	1.2E+00	7.9E-01
	4.1E-01	3.1E-01	1.5E-01			
1745 813	1.9E+00	2.8E-01	2.8E-02	6.4E-04	0.0E-01	0.0E-01
ASSP 3	1.2E+00	6.3E+00	1.3E+01	1.3E+01	1.5E+01	1.1E+01
	7.6E+00	5.1E+00	3.3E+00	2.2E+00	1.2E+00	7.4E-01
	5.3E-01	2.5E-01	1.3E-01			
1746 468	2.3E+00	3.7E-01	2.7E-02	1.4E-03	0.0E-01	3.5E-04
ASSP 3	5.3E-01	5.6E+00	1.3E+01	1.5E+01	1.6E+01	1.1E+01
	7.1E+00	5.3E+00	3.6E+00	2.4E+00	1.4E+00	1.0E+00
	5.8E-01	3.6E-01	2.5E-01			
1747 665	2.7E+00	3.6E-01	2.7E-02	1.9E-03	0.0E-01	0.0E-01
ASSP 3	5.4E-01	3.2E+00	1.1E+01	1.1E+01	1.6E+01	1.1E+01
	8.4E+00	6.2E+00	4.3E+00	2.8E+00	1.7E+00	8.9E-01
	6.0E-01	3.3E-01	2.1E-01			

1749 563	5.4E+00	7.9E-01	5.7E-02	7.5E-04	5.1E-04	0.0E-01
ASSP 3	1.4E-01	1.3E+00	5.4E+00	8.0E+00	1.5E+01	1.5E+01
	1.3E+01	9.9E+00	7.2E+00	4.5E+00	2.5E+00	1.5E+00
	8.6E-01	5.0E-01	3.0E-01			
1750 617	3.2E+00	4.4E-01	3.3E-02	0.0E-01	0.0E-01	3.2E-04
ASSP 3	1.3E-01	1.8E+00	6.6E+00	9.3E+00	1.5E+01	1.3E+01
	1.1E+01	8.1E+00	5.6E+00	3.6E+00	2.1E+00	1.4E+00
	7.4E-01	4.8E-01	2.7E-01			
1751 596	3.6E+00	4.9E-01	5.1E-02	6.8E-04	0.0E-01	0.0E-01
ASSP 3	1.5E-01	1.7E+00	7.0E+00	9.4E+00	1.5E+01	1.2E+01
	1.0E+01	7.5E+00	5.1E+00	3.4E+00	2.2E+00	1.2E+00
	6.8E-01	4.0E-01	2.2E-01			
1752 518	4.1E+00	7.0E-01	5.6E-02	1.5E-03	5.0E-04	0.0E-01
ASSP 3	1.0E-01	1.6E+00	7.8E+00	1.0E+01	1.6E+01	1.3E+01
	1.1E+01	7.7E+00	5.7E+00	3.5E+00	2.1E+00	1.2E+00
	6.4E-01	3.6E-01	1.9E-01			
1753 717	3.7E+00	5.9E-01	3.3E-02	4.2E-03	9.4E-04	0.0E-01
ASSP 3	2.1E-01	2.7E+00	7.7E+00	1.0E+01	1.5E+01	1.2E+01
	1.0E+01	7.1E+00	5.0E+00	2.9E+00	1.8E+00	1.0E+00
	6.4E-01	3.3E-01	1.8E-01			
1754 533	4.8E+00	6.7E-01	5.3E-02	0.0E-01	9.4E-04	0.0E-01
ASSP 1	2.5E-02	2.8E+00	1.0E+01	1.1E+01	9.8E+00	6.2E+00
	3.1E+00	1.5E+00	6.8E-01	2.7E-01	1.3E-01	6.9E-02
	2.8E-02	1.2E-02	9.8E-03			
1755 610	4.2E+00	6.1E-01	6.6E-02	0.0E-01	0.0E-01	3.3E-04
ASSP 1	4.1E-02	2.9E+00	1.1E+01	1.1E+01	1.0E+01	6.4E+00
	3.1E+00	1.5E+00	6.5E-01	2.9E-01	1.1E-01	6.5E-02
	2.8E-02	1.0E-02	0.0E-01			
1756 548	3.6E+00	6.4E-01	4.1E-02	1.3E-03	0.0E-01	0.0E-01
ASSP 1	4.8E-02	2.1E+00	9.7E+00	1.1E+01	9.7E+00	6.3E+00
	3.1E+00	1.5E+00	7.3E-01	2.7E-01	1.1E-01	4.5E-02
	1.8E-02	4.1E-03	1.4E-02			
1757 622	3.3E+00	4.6E-01	3.4E-02	1.8E-03	0.0E-01	0.0E-01
ASSP 4	1.1E+02	6.3E+01	6.9E+01	7.2E+01	5.8E+01	5.2E+01
	3.2E+01	2.0E+01	1.9E+01	1.5E+01	1.4E+01	1.2E+01
	1.0E+01	1.1E+01	1.0E+01			
1758 667	3.8E+00	5.5E-01	4.2E-02	6.7E-04	0.0E-01	0.0E-01
ASSP 4	1.1E+02	6.3E+01	7.1E+01	7.1E+01	5.3E+01	5.1E+01
	3.2E+01	2.1E+01	2.0E+01	1.6E+01	1.5E+01	1.2E+01
	1.1E+01	1.1E+01	1.0E+01			
1759 694	2.6E+00	3.8E-01	2.7E-02	6.7E-04	4.5E-04	0.0E-01
ASSP 4	1.7E+02	9.7E+01	9.7E+01	7.9E+01	6.3E+01	5.1E+01
	2.7E+01	1.5E+01	1.3E+01	1.1E+01	8.8E+00	7.7E+00
	6.5E+00	6.8E+00	6.1E+00			
1800 752	3.0E+00	5.6E-01	5.4E-02	1.9E-03	0.0E-01	3.2E-04
ASSP 2	2.9E-01	6.2E+00	2.3E+01	2.3E+01	1.4E+01	1.8E+01
	1.8E+01	1.6E+01	1.5E+01	1.4E+01	1.2E+01	8.9E+00
	7.9E+00	6.6E+00	6.1E+00			
1801 763	2.6E+00	5.2E-01	5.4E-02	0.0E-01	4.2E-04	0.0E-01
ASSP 2	4.9E-01	9.5E+00	3.6E+01	3.1E+01	1.5E+01	1.7E+01
	1.6E+01	1.3E+01	1.4E+01	1.1E+01	1.0E+01	7.5E+00
	6.5E+00	5.4E+00	5.1E+00			

1802 913	2.0E+00	4.0E-01	2.9E-02	6.3E-04	0.0E-01	0.0E-01
ASSP 4	2.3E+02	1.4E+02	1.1E+02	8.4E+01	7.2E+01	5.3E+01
	2.5E+01	1.6E+01	1.3E+01	9.6E+00	7.7E+00	6.6E+00
	6.0E+00	6.1E+00	5.1E+00			
1803 1048	1.8E+00	2.6E-01	2.4E-02	6.6E-04	0.0E-01	0.0E-01
ASSP 4	2.6E+02	1.4E+02	1.2E+02	7.9E+01	5.6E+01	4.3E+01
	2.3E+01	1.4E+01	1.2E+01	9.1E+00	7.2E+00	6.0E+00
	5.6E+00	5.2E+00	4.4E+00			
1804 1714	1.3E+00	2.5E-01	2.5E-02	7.2E-04	0.0E-01	3.6E-04
ASSP 4	2.2E+02	1.4E+02	1.2E+02	8.2E+01	6.6E+01	4.9E+01
	2.1E+01	1.2E+01	1.1E+01	8.5E+00	5.8E+00	5.0E+00
	4.8E+00	4.2E+00	3.6E+00			
1805 1918	9.5E-01	1.9E-01	1.2E-02	1.4E-03	0.0E-01	0.0E-01
ASSP 2	2.2E+00	4.8E+01	5.2E+01	3.2E+01	8.0E+00	7.3E+00
	5.0E+00	3.9E+00	3.8E+00	3.1E+00	2.6E+00	2.1E+00
	1.8E+00	1.3E+00	1.2E+00			
1806 1286	4.0E-01	9.5E-02	1.2E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 2	5.5E+00	5.8E+01	3.0E+01	1.7E+01	4.3E+00	4.0E+00
	3.4E+00	3.0E+00	2.7E+00	2.1E+00	2.0E+00	1.3E+00
	1.1E+00	1.1E+00	1.0E+00			
1807 1170	8.3E-01	1.1E-01	1.8E-02	6.3E-04	0.0E-01	0.0E-01
ASSP 4	8.0E+01	1.9E+02	1.3E+02	8.0E+01	5.7E+01	3.7E+01
	1.1E+01	5.8E+00	4.9E+00	3.6E+00	2.6E+00	2.4E+00
	2.0E+00	1.8E+00	1.6E+00			
1808 1465	1.3E+00	1.6E-01	1.8E-02	1.4E-03	4.7E-04	0.0E-01
ASSP 4	3.5E+02	1.5E+02	1.2E+02	8.2E+01	6.8E+01	4.4E+01
	1.7E+01	9.4E+00	7.6E+00	4.7E+00	3.6E+00	2.6E+00
	2.4E+00	2.4E+00	1.8E+00			
1809 4075	5.6E-01	8.1E-02	1.1E-02	6.6E-04	0.0E-01	0.0E-01
ASSP 4	3.6E+02	1.4E+02	1.2E+02	8.6E+01	7.8E+01	4.7E+01
	1.3E+01	5.5E+00	4.5E+00	2.6E+00	1.7E+00	1.6E+00
	1.4E+00	1.3E+00	1.4E+00			
1810 5628	3.2E-01	2.8E-02	9.0E-03	0.0E-01	4.5E-04	3.3E-04
ASSP 4	3.3E+02	1.5E+02	1.2E+02	6.7E+01	3.0E+01	1.6E+01
	5.6E+00	2.6E+00	1.9E+00	1.4E+00	7.8E-01	5.8E-01
	4.3E-01	4.5E-01	4.7E-01			
1811 6362	6.6E-02	1.1E-02	0.0E-01	6.2E-04	0.0E-01	0.0E-01
ASSP 4	3.3E+02	1.1E+02	5.7E+01	1.8E+01	2.4E+00	9.6E-01
	3.9E-01	1.4E-01	1.8E-01	9.6E-02	2.6E-02	0.0E-01
	0.0E-01	4.3E-02	0.0E-01			
1812 7617	7.3E-02	4.0E-03	0.0E-01	0.0E-01	4.6E-04	0.0E-01
ASSP 4	3.6E+02	8.9E+01	3.3E+01	1.0E+01	1.3E+00	6.5E-01
	1.9E-01	7.1E-02	1.2E-01	1.7E-02	1.7E-02	0.0E-01
	1.7E-02	8.7E-03	0.0E-01			
1813 7753	1.1E-01	8.2E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.9E+02	6.7E+01	2.1E+01	6.1E+00	8.0E-01	4.7E-01
	1.9E-01	7.1E-02	3.7E-02	1.7E-02	1.7E-02	8.7E-03
	0.0E-01	1.7E-02	0.0E-01			
1814 8159	3.8E-02	2.1E-02	0.0E-01	0.0E-01	4.8E-04	0.0E-01
ASSP 4	1.8E+02	5.4E+01	2.1E+01	7.0E+00	9.9E-01	4.5E-01
	2.3E-01	1.2E-01	3.7E-02	5.2E-02	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			

Fog 14. August 10-11 (Day 222-223) 1975

DAY 222	NUMBER DENSITY (NO./CC/MICRON)					
HOUR VSBY	1ST LINE = OAP	LINES	2,3&4 = ASSP			
2220 9308	4.1E-01	1.7E-02	1.8E-03	0.0E-01	0.0E-01	4.8E-04
ASSP 4	2.6E+02	8.3E+01	4.8E+01	2.3E+01	4.2E+00	7.0E-01
	5.7E-01	1.4E-01	1.6E-01	5.2E-02	8.7E-02	2.6E-02
	1.7E-02	1.7E-02	3.5E-02			
2221 8460	3.1E-01	3.5E-02	1.9E-03	9.9E-04	0.0E-01	4.9E-04
ASSP 4	2.9E+02	1.0E+02	5.5E+01	2.6E+01	5.3E+00	9.6E-01
	5.1E-01	1.0E-01	1.6E-01	6.9E-02	5.2E-02	6.9E-02
	7.8E-02	4.3E-02	8.7E-03			
2222 5982	4.0E-01	3.9E-02	1.6E-03	0.0E-01	5.7E-04	0.0E-01
ASSP 4	2.9E+02	1.2E+02	7.8E+01	4.1E+01	9.9E+00	2.2E+00
	1.6E+00	9.6E-01	6.2E-01	4.8E-01	5.8E-01	3.6E-01
	2.8E-01	2.9E-01	2.7E-01			
2223 2822	6.4E-01	9.4E-02	4.6E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	3.9E+02	1.9E+02	3.2E+00	1.0E+02	3.6E+01	1.2E+01
	7.0E+00	1.7E+00	1.2E+00	9.3E-01	9.9E-01	8.3E-01
	6.2E-01	5.9E-01	6.8E-01			
2224 7317	2.6E-01	3.4E-02	1.6E-03	8.3E-04	0.0E-01	0.0E-01
ASSP 4	2.1E+02	1.9E+02	8.9E+01	4.5E+01	1.1E+01	2.5E+00
	1.0E+00	4.9E-01	4.1E-01	3.3E-01	2.9E-01	2.3E-01
	1.9E-01	2.3E-01	1.8E-01			
2225 4949	4.8E-01	3.7E-02	1.7E-03	9.1E-04	0.0E-01	0.0E-01
ASSP 4	2.3E+01	1.5E+01	1.2E+02	7.5E+01	2.4E+01	4.6E+00
	2.3E+00	7.0E-01	5.1E-01	3.7E-01	2.5E-01	2.3E-01
	1.8E-01	1.8E-01	2.4E-01			
2226 6161	1.4E-01	1.6E-02	1.7E-03	0.0E-01	6.1E-04	0.0E-01
ASSP 4	1.7E+02	1.7E+02	1.0E+02	6.3E+01	1.9E+01	3.8E+00
	2.1E+00	6.1E-01	5.1E-01	3.7E-01	3.8E-01	3.7E-01
	3.0E-01	3.0E-01	3.4E-01			
2227 3510	4.8E-01	5.3E-02	1.7E-03	1.8E-03	0.0E-01	0.0E-01
ASSP 4	1.4E+02	1.8E+02	1.2E+02	8.6E+01	3.0E+01	7.6E+00
	4.2E+00	7.7E-01	5.7E-01	5.1E-01	4.7E-01	3.3E-01
	2.7E-01	2.9E-01	2.4E-01			
2228 2547	4.9E-01	6.4E-02	3.5E-03	1.8E-03	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.2E+02	8.9E+00	1.2E+02	6.7E+01	3.5E+01
	1.8E+01	2.3E+00	1.3E+00	9.6E-01	9.2E-01	6.2E-01
	4.5E-01	4.2E-01	5.0E-01			
2229 1862	1.0E+00	1.2E-01	2.0E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 4	6.4E+01	1.0E+02	6.6E+00	1.2E+02	6.5E+01	3.9E+01
	1.8E+01	2.9E+00	2.3E+00	1.8E+00	1.3E+00	1.2E+00
	1.0E+00	1.1E+00	8.7E-01			
2230 1198	8.2E-01	2.4E-01	1.8E-02	0.0E-01	5.8E-04	0.0E-01
ASSP 4	1.6E+02	1.2E+02	2.8E+00	1.2E+02	7.9E+01	5.5E+01
	2.5E+01	5.9E+00	4.6E+00	3.4E+00	2.8E+00	2.0E+00
	1.5E+00	1.5E+00	1.6E+00			
2231 901	1.3E+00	4.4E-01	3.5E-02	8.4E-04	5.6E-04	0.0E-01
ASSP 4	5.0E+01	6.1E+01	1.0E+02	1.0E+02	9.6E+01	7.7E+01
	4.0E+01	1.2E+01	9.6E+00	6.6E+00	5.2E+00	2.7E+00
	2.5E+00	2.0E+00	2.1E+00			

2232 745	2.5E+00	5.2E-01	5.5E-02	1.8E-03	1.2E-03	0.0E-01
ASSP 4	1.0E+02	1.0E+02	1.2E+02	1.0E+02	9.1E+01	7.1E+01
	3.6E+01	1.4E+01	1.2E+01	8.8E+00	6.4E+00	4.7E+00
	4.4E+00	4.2E+00	3.9E+00			
2233 685	2.5E+00	5.2E-01	5.6E-02	3.2E-03	1.1E-03	0.0E-01
ASSP 4	6.9E+01	7.5E+01	1.0E+02	1.0E+02	8.5E+01	7.0E+01
	3.5E+01	1.5E+01	1.3E+01	1.0E+01	7.1E+00	5.3E+00
	4.3E+00	5.1E+00	4.1E+00			
2234 574	5.2E+00	1.2E+00	1.2E-01	3.0E-03	6.7E-04	0.0E-01
ASSP 3	2.7E-01	4.4E+00	8.8E+00	8.7E+00	1.2E+01	1.1E+01
	9.3E+00	7.6E+00	5.9E+00	3.8E+00	2.7E+00	1.5E+00
	9.9E-01	5.8E-01	3.6E-01			
2235 443	5.7E+00	1.3E+00	1.4E-01	8.7E-04	1.8E-03	8.7E-04
ASSP 3	2.6E-01	2.8E+00	8.1E+00	8.9E+00	1.5E+01	1.4E+01
	1.3E+01	1.0E+01	8.3E+00	5.5E+00	3.6E+00	2.3E+00
	1.3E+00	8.7E-01	4.0E-01			
2236 491	4.3E+00	1.0E+00	1.5E-01	6.7E-03	1.1E-03	0.0E-01
ASSP 1	4.3E-02	1.5E+00	6.5E+00	8.3E+00	9.3E+00	7.5E+00
	4.6E+00	3.1E+00	1.6E+00	6.7E-01	3.0E-01	1.3E-01
	4.9E-02	3.2E-02	3.9E-03			
2237 428	4.7E+00	1.1E+00	1.1E-01	3.9E-03	0.0E-01	3.9E-04
ASSP 1	4.8E-02	2.2E+00	8.3E+00	9.7E+00	9.1E+00	7.1E+00
	4.1E+00	2.4E+00	1.3E+00	6.0E-01	2.9E-01	1.1E-01
	4.9E-02	1.6E-02	7.8E-03			
2238 549	5.0E+00	1.1E+00	1.4E-01	5.4E-03	0.0E-01	4.5E-04
ASSP 1	5.8E-02	3.1E+00	8.9E+00	9.2E+00	8.5E+00	6.6E+00
	3.7E+00	2.4E+00	1.1E+00	5.6E-01	2.4E-01	7.5E-02
	4.9E-02	2.0E-02	3.9E-03			
2239 414	6.5E+00	1.2E+00	1.4E-01	3.8E-03	1.0E-03	3.8E-04
ASSP 2	5.4E-01	5.6E+00	2.8E+01	2.8E+01	1.2E+01	1.4E+01
	1.4E+01	1.2E+01	1.3E+01	1.2E+01	1.1E+01	8.7E+00
	8.1E+00	7.5E+00	7.4E+00			
2240 348	5.6E+00	1.5E+00	1.7E-01	5.0E-03	1.1E-03	4.2E-04
ASSP 2	9.0E-01	6.6E+00	2.9E+01	2.8E+01	1.2E+01	1.5E+01
	1.3E+01	1.1E+01	1.2E+01	1.2E+01	1.1E+01	8.7E+00
	7.8E+00	7.5E+00	7.5E+00			
2241 465	7.9E+00	1.6E+00	1.8E-01	4.5E-03	1.8E-03	0.0E-01
ASSP 2	6.1E-01	5.3E+00	2.3E+01	2.2E+01	1.2E+01	1.6E+01
	1.5E+01	1.5E+01	1.5E+01	1.4E+01	1.3E+01	1.0E+01
	9.2E+00	8.1E+00	7.3E+00			
2242 400	5.6E+00	1.1E+00	1.3E-01	6.2E-03	0.0E-01	7.7E-04
ASSP 1	4.1E-02	2.3E+00	8.8E+00	9.9E+00	9.2E+00	7.4E+00
	4.3E+00	2.7E+00	1.4E+00	6.8E-01	2.5E-01	1.1E-01
	3.0E-02	3.4E-02	9.8E-03			
2243 372	4.9E+00	1.0E+00	1.4E-01	4.3E-03	5.9E-04	8.6E-04
ASSP 1	5.1E-02	3.6E+00	1.0E+01	9.8E+00	8.0E+00	6.5E+00
	3.5E+00	2.1E+00	1.2E+00	5.2E-01	2.2E-01	8.3E-02
	3.3E-02	2.0E-02	3.9E-03			
2244 383	6.3E+00	1.1E+00	1.7E-01	3.4E-03	1.1E-03	0.0E-01
ASSP 1	4.1E-02	1.8E+00	1.0E+01	1.2E+01	1.1E+01	7.2E+00
	4.3E+00	2.3E+00	1.2E+00	4.6E-01	2.0E-01	7.3E-02
	2.4E-02	8.1E-03	5.9E-03			

2300 270	1.4E+01	3.3E+00	6.1E-01	2.2E-02	5.1E-03	1.4E-03
ASSP 1	1.0E-02	1.3E-01	4.3E+00	1.1E+01	1.4E+01	1.1E+01
	6.8E+00	3.9E+00	1.8E+00	7.0E-01	3.0E-01	1.1E-01
	3.4E-02	3.6E-02	1.2E-02			
2301 321	1.1E+01	3.0E+00	6.2E-01	3.9E-02	5.9E-03	2.2E-03
ASSP 1	2.5E-03	1.1E-01	3.9E+00	1.1E+01	1.4E+01	1.2E+01
	7.5E+00	4.8E+00	2.4E+00	1.1E+00	5.7E-01	2.1E-01
	7.9E-02	5.9E-02	2.9E-02			
2302 333	1.1E+01	2.9E+00	4.5E-01	9.1E-03	3.1E-03	9.0E-04
ASSP 1	0.0E-01	1.4E-01	4.1E+00	1.0E+01	1.3E+01	1.1E+01
	6.2E+00	3.6E+00	1.4E+00	5.1E-01	2.0E-01	8.7E-02
	3.2E-02	2.2E-02	9.8E-03			
2313 276	1.2E+01	3.7E+00	6.9E-01	1.2E-02	2.0E-03	0.0E-01
ASSP 2	5.0E-01	3.0E+00	8.2E+00	6.7E+00	7.0E+00	1.0E+01
	1.2E+01	1.5E+01	1.6E+01	1.6E+01	1.6E+01	1.4E+01
	1.3E+01	1.3E+01	1.3E+01			
2314 263	1.2E+01	3.9E+00	7.3E-01	2.0E-02	0.0E-01	0.0E-01
ASSP 2	5.1E-01	3.2E+00	7.0E+00	6.1E+00	6.4E+00	9.4E+00
	1.2E+01	1.5E+01	1.7E+01	1.6E+01	1.6E+01	1.4E+01
	1.3E+01	1.3E+01	1.3E+01			
2315 289	1.2E+01	3.7E+00	7.0E-01	2.9E-02	3.1E-03	0.0E-01
ASSP 2	5.0E-01	2.8E+00	7.2E+00	6.2E+00	6.2E+00	9.7E+00
	1.2E+01	1.5E+01	1.7E+01	1.5E+01	1.6E+01	1.4E+01
	1.3E+01	1.3E+01	1.2E+01			
2316 257	1.2E+01	4.1E+00	9.1E-01	3.1E-02	1.2E-03	4.6E-04
ASSP 2	7.2E-01	3.3E+00	7.5E+00	5.5E+00	5.4E+00	8.7E+00
	1.0E+01	1.4E+01	1.6E+01	1.4E+01	1.5E+01	1.3E+01
	1.3E+01	1.2E+01	1.2E+01			
2333 226	7.6E+00	3.1E+00	1.2E+00	4.5E-02	3.4E-03	5.0E-04
ASSP 3	2.6E-02	1.1E-01	2.2E-01	9.2E-01	3.1E+00	6.6E+00
	1.0E+01	1.4E+01	1.5E+01	1.3E+01	1.2E+01	9.4E+00
	6.5E+00	4.2E+00	2.3E+00			
2334 237	6.9E+00	2.9E+00	1.1E+00	4.8E-02	8.1E-03	3.5E-03
ASSP 3	5.2E-02	1.6E-01	3.8E-01	1.2E+00	3.4E+00	7.5E+00
	1.0E+01	1.3E+01	1.3E+01	1.1E+01	9.9E+00	8.0E+00
	5.8E+00	4.3E+00	2.5E+00			
2335 227	7.5E+00	3.1E+00	1.1E+00	8.4E-02	1.4E-02	3.1E-03
ASSP 3	7.4E-02	2.4E-01	4.2E-01	1.2E+00	4.0E+00	7.2E+00
	9.8E+00	1.2E+01	1.2E+01	1.1E+01	9.8E+00	7.9E+00
	6.0E+00	4.4E+00	3.0E+00			

0013 439	5.8E+00	1.8E+00	2.4E-01	4.9E-03	0.0E-01	0.0E-01
ASSP 3	1.3E-02	1.6E-01	1.1E+00	4.5E+00	1.0E+01	1.7E+01
	1.2E+01	1.1E+01	7.9E+00	4.4E+00	2.4E+00	1.2E+00
	4.7E-01	1.9E-01	1.0E-01			
0014 432	5.0E+00	1.8E+00	2.6E-01	8.2E-03	7.9E-04	0.0E-01
ASSP 3	4.3E-03	1.6E-01	1.0E+00	4.4E+00	9.9E+00	1.3E+01
	1.2E+01	1.0E+01	8.2E+00	4.6E+00	2.5E+00	1.3E+00
	5.6E-01	2.4E-01	9.4E-02			
0014 394	4.6E+00	1.7E+00	2.4E-01	7.5E-03	7.2E-04	0.0E-01
ASSP 3	4.3E-03	1.6E-01	1.0E+00	4.4E+00	9.9E+00	1.3E+01
	1.2E+01	1.0E+01	8.2E+00	4.6E+00	2.5E+00	1.3E+00
	5.6E-01	2.4E-01	9.4E-02			
0016 399	5.0E+00	1.7E+00	2.7E-01	2.2E-03	0.0E-01	0.0E-01
ASSP 3	1.3E-02	1.4E-01	9.6E-01	4.0E+00	9.9E+00	1.3E+01
	1.3E+01	8.0E+00	4.3E+00	2.2E+00	1.2E+00	6.0E-01
	2.3E-01	7.6E-02	0.0E-01			
0023 394	6.5E+00	2.1E+00	3.7E-01	3.5E-03	7.9E-04	0.0E-01
ASSP 1	1.2E-01	8.3E-01	5.4E+00	1.5E+00	1.8E+00	3.0E+00
	3.2E+00	3.9E+00	3.7E+00	3.5E+00	3.5E+00	3.5E+00
	3.2E+00	3.2E+00	2.8E+00			
0024 336	5.1E+00	2.0E+00	4.1E-01	6.8E-03	6.5E-04	4.8E-04
ASSP 1	5.1E-03	2.3E-02	9.9E-01	5.5E+00	1.1E+01	1.1E+01
	6.9E+00	3.4E+00	1.2E+00	3.2E-01	6.5E-02	1.6E-02
	2.0E-03	0.0E-01	0.0E-01			
0025 351	6.0E+00	2.2E+00	4.6E-01	1.1E-03	2.2E-03	0.0E-01
ASSP 1	2.5E-03	2.1E-02	8.3E-01	5.2E+00	1.1E+01	1.1E+01
	7.2E+00	3.9E+00	1.4E+00	3.2E-01	6.5E-02	1.4E-02
	2.0E-03	0.0E-01	0.0E-01			
0026 345	5.2E+00	2.3E+00	5.4E-01	5.4E-03	0.0E-01	0.0E-01
ASSP 1	5.1E-03	4.2E-02	6.6E-01	4.7E+00	1.1E+01	1.1E+01
	7.8E+00	4.7E+00	2.0E+00	5.0E-01	1.4E-01	3.2E-02
	6.1E-03	2.0E-03	0.0E-01			
0027 417	5.9E+00	2.2E+00	4.3E-01	4.2E-03	1.4E-03	5.2E-04
ASSP 1	0.0E-01	2.9E-02	7.4E-01	5.0E+00	1.1E+01	1.1E+01
	7.4E+00	4.4E+00	1.7E+00	3.7E-01	7.9E-02	1.6E-02
	4.1E-03	6.1E-03	0.0E-01			
0028 379	5.4E+00	1.8E+00	4.2E-01	5.4E-03	0.0E-01	5.3E-04
ASSP 3	1.7E-02	9.3E-02	4.1E-01	2.4E+00	6.7E+00	1.2E+01
	1.2E+01	1.3E+01	1.1E+01	7.9E+00	5.8E+00	3.6E+00
	2.0E+00	1.1E+00	4.5E-01			
0029 347	4.7E+00	1.8E+00	4.2E-01	3.2E-03	0.0E-01	5.2E-04
ASSP 3	8.7E-03	1.3E-01	4.0E-01	2.7E+00	8.0E+00	1.2E+01
	1.2E+01	1.2E+01	1.1E+01	7.4E+00	5.1E+00	2.9E+00
	1.6E+00	7.6E-01	2.4E-01			
0030 360	5.7E+00	1.9E+00	4.4E-01	7.0E-03	0.0E-01	0.0E-01
ASSP 3	1.7E-02	9.7E-02	3.7E-01	2.6E+00	7.6E+00	1.2E+01
	1.2E+01	1.1E+01	9.9E+00	6.8E+00	5.0E+00	3.0E+00
	1.5E+00	7.6E-01	2.9E-01			
0031 319	5.9E+00	1.7E+00	4.5E-01	6.7E-03	1.5E-03	5.5E-04
ASSP 3	1.3E-02	7.9E-02	4.3E-01	2.7E+00	7.4E+00	1.2E+01
	1.2E+01	1.1E+01	9.8E+00	6.9E+00	4.8E+00	3.0E+00
	1.5E+00	7.3E-01	3.2E-01			

0032 297	5.7E+00	1.9E+00	4.4E-01	1.2E-02	7.4E-04	0.0E-01
ASSP 4	1.7E+02	1.4E+02	1.1E+02	6.2E+01	5.7E+01	3.0E+01
	1.6E+01	1.2E+01	1.0E+01	8.4E+00	8.0E+00	7.6E+00
	6.6E+00	7.1E+00	6.3E+00			
0033 299	6.6E+00	2.4E+00	4.7E-01	1.1E-02	0.0E-01	0.0E-01
ASSP 4	2.6E+02	1.6E+02	1.2E+02	5.7E+01	5.0E+01	2.7E+01
	1.6E+01	1.2E+01	1.0E+01	8.0E+00	7.5E+00	7.2E+00
	6.6E+00	6.5E+00	6.0E+00			
0034 299	5.1E+00	2.0E+00	5.0E-01	1.3E-02	8.0E-04	0.0E-01
ASSP 2	6.0E-01	4.0E+00	2.3E+01	8.0E+00	6.9E+00	9.9E+00
	1.0E+01	1.1E+01	1.1E+01	1.0E+01	1.1E+01	8.9E+00
	8.5E+00	8.4E+00	8.5E+00			
0035 323	4.5E+00	1.8E+00	3.9E-01	1.2E-02	0.0E-01	5.1E-04
ASSP 2	4.3E-01	3.0E+00	1.9E+01	7.4E+00	6.4E+00	9.8E+00
	1.0E+01	1.1E+01	1.1E+01	1.1E+01	1.1E+01	9.0E+00
	9.0E+00	9.0E+00	8.7E+00			
0036 276	4.4E+00	2.0E+00	4.2E-01	8.1E-03	1.4E-03	5.0E-04
ASSP 1	0.0E-01	4.4E-02	9.5E-01	6.0E+00	1.2E+01	1.1E+01
	7.5E+00	4.4E+00	1.8E+00	5.2E-01	1.5E-01	1.6E-02
	4.1E-03	6.1E-03	2.0E-03			
0037 304	5.6E+00	2.0E+00	4.5E-01	7.4E-03	2.1E-03	1.0E-03
ASSP 1	2.5E-03	5.5E-02	1.0E+00	6.1E+00	1.2E+01	1.2E+01
	7.9E+00	4.5E+00	1.9E+00	7.5E-01	1.8E-01	3.4E-02
	6.1E-03	6.1E-03	0.0E-01			
0038 281	4.7E+00	1.9E+00	3.4E-01	3.2E-03	1.4E-03	5.3E-04
ASSP 1	5.1E-03	2.9E-02	1.1E+00	6.3E+00	1.3E+01	1.2E+01
	7.8E+00	4.4E+00	1.9E+00	6.4E-01	1.7E-01	3.0E-02
	2.0E-03	6.1E-03	0.0E-01			
0039 305	5.7E+00	2.3E+00	3.6E-01	7.5E-03	7.3E-04	5.3E-04
ASSP 3	8.7E-03	9.7E-02	5.3E-01	3.1E+00	1.0E+01	1.5E+01
	1.5E+01	1.4E+01	1.1E+01	7.8E+00	5.0E+00	2.7E+00
	1.4E+00	7.4E-01	2.7E-01			
0040 277	6.4E+00	2.0E+00	3.4E-01	6.8E-03	0.0E-01	5.6E-04
ASSP 3	2.6E-02	8.6E-02	5.4E-01	3.4E+00	1.1E+01	1.6E+01
	1.5E+01	1.4E+01	1.1E+01	7.1E+00	4.3E+00	2.3E+00
	1.0E+00	5.0E-01	2.3E-01			
0041 300	4.8E+00	2.2E+00	3.7E-01	4.3E-03	0.0E-01	5.4E-04
ASSP 3	8.7E-03	1.1E-01	6.3E-01	3.4E+00	1.1E+01	1.5E+01
	1.5E+01	1.3E+01	1.1E+01	7.1E+00	4.6E+00	2.4E+00
	1.1E+00	4.8E-01	2.0E-01			
0042 353	4.1E+00	2.2E+00	4.5E-01	7.1E-03	0.0E-01	0.0E-01
ASSP 3	8.7E-03	7.5E-02	5.0E-01	3.2E+00	9.5E+00	1.4E+01
	1.4E+01	1.3E+01	1.1E+01	7.5E+00	4.8E+00	2.8E+00
	1.5E+00	6.9E-01	2.7E-01			
0043 346	4.5E+00	1.6E+00	3.5E-01	8.1E-03	0.0E-01	0.0E-01
ASSP 3	1.7E-02	8.6E-02	4.9E-01	2.9E+00	8.5E+00	1.2E+01
	1.2E+01	1.1E+01	9.4E+00	7.0E+00	4.5E+00	2.5E+00
	1.4E+00	6.7E-01	2.5E-01			

0044 378	3.7E+00	1.4E+00	3.0E-01	4.4E-03	7.4E-04	0.0E-01
ASSP 3	4.3E-03	5.4E-02	4.4E-01	2.2E+00	5.4E+00	9.4E+00
	9.6E+00	9.6E+00	8.2E+00	6.2E+00	4.1E+00	2.4E+00
	1.2E+00	5.7E-01	2.1E-01			
0045 368	4.4E+00	1.4E+00	2.9E-01	7.8E-03	0.0E-01	0.0E-01
ASSP 3	8.7E-03	5.0E-02	3.7E-01	2.4E+00	5.7E+00	1.0E+01
	1.0E+01	1.0E+01	8.5E+00	5.7E+00	3.7E+00	2.1E+00
	1.1E+00	5.6E-01	1.7E-01			
0046 348	4.5E+00	1.6E+00	2.9E-01	7.0E-03	0.0E-01	0.0E-01
ASSP 3	8.7E-03	1.0E-01	5.7E-01	2.7E+00	6.3E+00	1.0E+01
	9.6E+00	9.8E+00	7.9E+00	5.3E+00	3.3E+00	1.9E+00
	8.3E-01	5.2E-01	1.8E-01			
0047 424	4.1E+00	1.6E+00	2.7E-01	6.2E-03	1.7E-03	0.0E-01
ASSP 3	1.3E-02	9.7E-02	4.9E-01	2.6E+00	6.4E+00	9.9E+00
	9.6E+00	9.2E+00	7.8E+00	5.3E+00	3.3E+00	1.9E+00
	9.0E-01	5.2E-01	1.8E-01			
0048 393	3.3E+00	1.2E+00	2.5E-01	4.6E-03	0.0E-01	0.0E-01
ASSP 3	2.2E-02	6.8E-02	5.3E-01	2.4E+00	5.9E+00	9.5E+00
	9.1E+00	9.1E+00	7.8E+00	5.1E+00	3.4E+00	2.0E+00
	1.1E+00	6.3E-01	2.4E-01			
0049 418	3.5E+00	1.4E+00	3.5E-01	6.0E-03	8.1E-04	0.0E-01
ASSP 3	1.3E-02	1.1E-01	5.2E-01	2.6E+00	6.1E+00	9.4E+00
	8.9E+00	8.9E+00	7.6E+00	5.4E+00	3.6E+00	2.4E+00
	1.2E+00	5.6E-01	2.5E-01			
0050 399	4.8E+00	1.4E+00	2.6E-01	1.0E-02	0.0E-01	0.0E-01
ASSP 3	4.3E-03	1.0E-01	6.8E-01	3.0E+00	6.3E+00	9.4E+00
	9.2E+00	8.8E+00	7.5E+00	5.0E+00	3.1E+00	1.7E+00
	8.1E-01	4.4E-01	1.8E-01			
0051 471	4.2E+00	1.4E+00	2.9E-01	4.7E-03	0.0E-01	0.0E-01
ASSP 3	8.7E-03	5.4E-02	6.6E-01	2.9E+00	6.0E+00	9.0E+00
	8.5E+00	8.5E+00	7.1E+00	4.9E+00	3.2E+00	2.2E+00
	9.7E-01	5.7E-01	2.1E-01			
0052 483	4.1E+00	1.1E+00	2.3E-01	7.3E-03	8.2E-04	0.0E-01
ASSP 3	1.3E-02	3.0E-01	6.5E-01	2.6E+00	5.4E+00	8.4E+00
	8.1E+00	8.3E+00	7.2E+00	5.0E+00	3.3E+00	1.8E+00
	9.7E-01	5.9E-01	2.0E-01			
0053 573	2.9E+00	1.1E+00	2.0E-01	2.4E-03	0.0E-01	1.2E-03
ASSP 3	4.3E-03	1.6E-01	5.4E-01	2.0E+00	4.4E+00	7.5E+00
	7.5E+00	7.8E+00	6.7E+00	4.7E+00	3.0E+00	1.8E+00
	8.1E-01	4.2E-01	1.3E-01			

0055 570	2.2E+00	7.9E-01	1.4E-01	3.0E-03	0.0E-01	5.0E-04
ASSP 2	4.0E+00	2.7E+01	3.9E+01	1.2E+01	8.9E+00	7.7E+00
	6.8E+00	6.7E+00	7.2E+00	6.3E+00	6.4E+00	4.9E+00
	4.4E+00	4.5E+00	4.6E+00			
0056 632	2.8E+00	9.1E-01	1.8E-01	4.9E-03	0.0E-01	6.0E-04
ASSP 2	5.2E+00	2.8E+01	3.6E+01	1.4E+01	1.0E+01	7.5E+00
	6.1E+00	6.0E+00	6.3E+00	5.8E+00	5.6E+00	4.8E+00
	4.2E+00	3.9E+00	4.1E+00			

0057 632	2.1E+00	9.2E-01	1.5E-01	2.4E-03	0.0E-01	6.0E-04
ASSP 3	2.2E-02	1.2E+00	1.4E+00	4.1E+00	6.9E+00	7.3E+00
	6.8E+00	6.2E+00	5.0E+00	3.3E+00	1.9E+00	1.1E+00
	3.9E-01	1.6E-01	5.8E-02			
0058 713	2.0E+00	7.3E-01	8.8E-02	2.3E-03	0.0E-01	0.0E-01
ASSP 3	4.3E-03	3.7E-01	1.5E+00	4.1E+00	6.3E+00	6.7E+00
	5.8E+00	5.6E+00	4.2E+00	2.5E+00	1.4E+00	6.6E-01
	2.8E-01	7.9E-02	2.7E-02			
0059 778	2.4E+00	5.1E-01	4.4E-02	2.1E-03	2.1E-03	5.2E-04
ASSP 3	8.7E-03	4.4E-01	1.5E+00	3.7E+00	5.6E+00	5.5E+00
	5.2E+00	4.0E+00	2.5E+00	1.2E+00	4.7E-01	1.3E-01
	4.6E-02	9.1E-03	0.0E-01			
0100 1057	1.6E+00	4.6E-01	2.7E-02	1.0E-03	7.0E-04	1.0E-03
ASSP 4	3.4E+02	1.2E+02	1.2E+02	5.2E+01	3.8E+01	1.6E+01
	1.1E+01	7.3E+00	5.8E+00	4.2E+00	3.8E+00	3.8E+00
	3.7E+00	3.2E+00	3.0E+00			
0101 838	1.8E+00	2.3E-01	7.9E-03	5.2E-03	1.4E-03	0.0E-01
ASSP 4	3.2E+02	6.4E+01	1.2E+02	5.2E+01	3.9E+01	1.3E+01
	9.4E+00	6.2E+00	4.7E+00	4.1E+00	4.2E+00	3.6E+00
	3.0E+00	3.2E+00	2.8E+00			
0102 1009	1.8E+00	4.3E-01	5.8E-02	3.7E-03	1.7E-03	6.1E-04
ASSP 3	1.4E-01	4.4E+00	2.5E+00	3.9E+00	5.3E+00	4.4E+00
	3.6E+00	2.5E+00	1.5E+00	7.2E-01	2.4E-01	7.6E-02
	4.0E-02	0.0E-01	3.0E-03			
0103 1155	1.0E+00	3.0E-01	1.7E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.0E-01	3.0E+00	2.3E+00	4.3E+00	5.0E+00	4.5E+00
	3.4E+00	2.4E+00	1.4E+00	6.2E-01	2.7E-01	9.4E-02
	2.7E-02	6.1E-03	6.1E-03			
0104 983	1.4E+00	2.3E-01	1.4E-02	1.1E-03	0.0E-01	1.1E-03
ASSP 3	2.6E-01	4.0E+00	2.2E+00	3.6E+00	4.2E+00	3.5E+00
	2.7E+00	1.8E+00	1.1E+00	4.9E-01	2.5E-01	1.0E-01
	3.0E-02	1.2E-02	0.0E-01			
0105 963	1.4E+00	4.0E-01	3.3E-02	2.2E-03	0.0E-01	5.4E-04
ASSP 3	1.5E-01	3.6E+00	2.7E+00	4.1E+00	5.1E+00	4.5E+00
	3.4E+00	2.4E+00	1.6E+00	7.3E-01	3.5E-01	1.3E-01
	4.9E-02	3.0E-03	3.0E-03			
0106 951	1.4E+00	3.2E-01	5.4E-02	2.2E-03	0.0E-01	5.4E-04
ASSP 4	1.2E+02	1.5E+02	1.2E+02	6.5E+01	6.2E+01	2.0E+01
	1.4E+01	8.5E+00	5.7E+00	3.7E+00	3.4E+00	3.2E+00
	2.8E+00	2.8E+00	2.7E+00			
0107 884	1.3E+00	3.1E-01	6.8E-02	0.0E-01	1.4E-03	2.1E-03
ASSP 4	2.2E+02	1.6E+02	1.2E+02	7.5E+01	7.1E+01	2.7E+01
	1.8E+01	1.0E+01	6.0E+00	3.8E+00	3.2E+00	2.8E+00
	2.9E+00	2.6E+00	2.1E+00			

0109 837	1.2E+00	4.1E-01	5.7E-02	3.3E-03	1.5E-03	0.0E-01
ASSP 2	7.6E-01	2.8E+01	4.1E+01	1.9E+01	1.2E+01	8.5E+00
	4.5E+00	4.1E+00	4.2E+00	3.6E+00	3.7E+00	3.0E+00
	2.9E+00	2.5E+00	2.6E+00			
0110 840	1.7E+00	5.4E-01	8.1E-02	4.0E-03	0.0E-01	0.0E-01
ASSP 2	1.1E+00	2.0E+01	3.3E+01	1.4E+01	9.6E+00	7.7E+00
	5.9E+00	5.7E+00	5.2E+00	4.9E+00	5.1E+00	4.2E+00
	3.7E+00	3.3E+00	3.3E+00			
0112 835	1.8E+00	6.0E-01	7.1E-02	1.9E-03	0.0E-01	0.0E-01
ASSP 4	9.1E+01	2.0E+02	1.2E+02	5.9E+01	5.3E+01	2.3E+01
	1.4E+01	8.7E+00	5.7E+00	3.6E+00	3.0E+00	2.9E+00
	2.8E+00	2.9E+00	2.9E+00			
0113 889	1.6E+00	5.1E-01	9.1E-02	1.1E-03	0.0E-01	0.0E-01
ASSP 4	2.7E+02	3.6E+01	1.3E+02	5.6E+01	4.4E+01	2.0E+01
	1.2E+01	6.9E+00	5.7E+00	3.8E+00	3.3E+00	3.2E+00
	2.5E+00	3.0E+00	2.8E+00			
0115 870	1.5E+00	7.6E-01	6.0E-02	4.2E-03	7.1E-04	5.2E-04
ASSP 3	3.5E-02	1.8E+00	1.5E+00	3.3E+00	5.6E+00	6.4E+00
	5.5E+00	4.6E+00	3.3E+00	1.7E+00	8.9E-01	3.9E-01
	9.7E-02	3.0E-02	3.0E-03			
0116 906	2.2E+00	5.9E-01	8.7E-02	0.0E-01	0.0E-01	5.4E-04
ASSP 3	3.9E-02	3.3E+00	2.1E+00	3.9E+00	5.4E+00	5.5E+00
	5.0E+00	4.3E+00	2.8E+00	1.7E+00	7.4E-01	2.5E-01
	7.9E-02	2.4E-02	3.0E-03			
0117 1035	1.7E+00	5.0E-01	5.5E-02	1.1E-03	7.5E-04	0.0E-01
ASSP 3	1.2E-01	5.5E+00	2.4E+00	3.1E+00	4.2E+00	4.5E+00
	4.2E+00	3.5E+00	2.4E+00	1.2E+00	5.3E-01	2.6E-01
	7.6E-02	9.1E-03	1.8E-02			
0119 1478	1.8E+00	3.3E-01	1.5E-02	1.2E-03	0.0E-01	5.7E-04
ASSP 4	3.5E+01	1.9E+02	1.2E+02	6.4E+01	6.2E+01	2.0E+01
	1.1E+01	6.8E+00	4.0E+00	2.4E+00	2.3E+00	2.3E+00
	2.2E+00	2.2E+00	1.8E+00			
0120 1571	1.1E+00	1.3E-01	1.4E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.6E+02	3.9E+01	1.2E+02	5.3E+01	4.1E+01	1.7E+01
	7.9E+00	4.6E+00	2.8E+00	2.1E+00	1.8E+00	1.6E+00
	1.5E+00	1.5E+00	1.4E+00			
0121 1389	1.7E+00	1.8E-01	2.1E-03	1.1E-03	7.3E-04	0.0E-01
ASSP 3	6.9E-02	1.4E+00	1.8E+00	2.6E+00	3.2E+00	3.1E+00
	2.1E+00	1.5E+00	8.2E-01	3.9E-01	1.2E-01	3.6E-02
	3.0E-03	0.0E-01	0.0E-01			
0122 2027	9.6E-01	1.6E-01	7.7E-03	1.0E-03	0.0E-01	0.0E-01
ASSP 3	6.0E-01	4.7E+00	2.8E+00	2.3E+00	2.7E+00	2.6E+00
	1.7E+00	1.1E+00	6.3E-01	2.2E-01	8.5E-02	1.8E-02
	6.1E-03	0.0E-01	0.0E-01			
0123 2179	7.9E-01	9.8E-02	3.6E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.2E+00	3.6E+00	2.2E+00	1.8E+00	1.9E+00	1.7E+00
	1.0E+00	8.0E-01	2.9E-01	1.4E-01	4.0E-02	1.8E-02
	9.1E-03	0.0E-01	0.0E-01			

0124 2731	5.1E-01	9.4E-02	6.1E-03	1.1E-03	0.0E-01	0.0E-01
ASSP 4	1.5E+02	5.2E+01	1.3E+02	5.0E+01	3.8E+01	1.1E+01
	4.9E+00	3.2E+00	2.5E+00	1.8E+00	1.7E+00	1.5E+00
	1.4E+00	1.2E+00	1.2E+00			
0125 2450	4.1E-01	6.4E-02	0.0E-01	2.2E-03	0.0E-01	5.4E-04
ASSP 4	2.6E+02	5.5E+01	1.3E+02	3.5E+01	1.4E+01	3.6E+00
	1.3E+00	8.9E-01	8.9E-01	6.1E-01	5.0E-01	5.1E-01
	4.5E-01	5.2E-01	4.6E-01			
0126 1476	1.0E+00	1.2E-01	3.4E-03	1.1E-03	0.0E-01	0.0E-01
ASSP 4	2.3E+02	2.0E+02	1.1E+02	4.2E+01	3.0E+01	1.3E+01
	3.6E+00	2.3E+00	2.2E+00	1.1E+00	1.3E+00	1.0E+00
	1.1E+00	1.0E+00	9.1E-01			
0127 2088	6.9E-01	1.9E-01	4.5E-03	1.2E-03	0.0E-01	0.0E-01
ASSP 4	1.8E+02	1.6E+02	1.3E+02	6.7E+01	6.9E+01	2.0E+01
	8.1E+00	4.8E+00	2.9E+00	1.3E+00	1.2E+00	1.3E+00
	9.6E-01	1.0E+00	9.1E-01			
0128 1983	9.6E-01	1.2E-01	1.3E-02	0.0E-01	7.6E-04	0.0E-01
ASSP 4	2.4E+02	1.8E+02	1.2E+02	4.7E+01	3.9E+01	1.1E+01
	4.9E+00	3.1E+00	2.3E+00	1.6E+00	1.7E+00	1.5E+00
	1.5E+00	1.4E+00	1.4E+00			
0129 1598	6.8E-01	1.6E-01	1.4E-02	1.1E-03	1.4E-03	0.0E-01
ASSP 4	2.2E+02	1.7E+02	1.2E+02	5.1E+01	4.4E+01	1.3E+01
	3.7E+00	2.5E+00	1.8E+00	1.3E+00	1.3E+00	1.1E+00
	1.1E+00	9.4E-01	9.2E-01			
0130 1281	1.0E+00	2.8E-01	3.1E-02	0.0E-01	7.8E-04	0.0E-01
ASSP 4	2.6E+02	1.6E+02	1.2E+02	5.5E+01	5.1E+01	1.6E+01
	5.9E+00	3.6E+00	2.8E+00	1.6E+00	1.4E+00	1.5E+00
	1.2E+00	1.3E+00	1.1E+00			
0131 1208	1.1E+00	3.5E-01	5.3E-02	1.1E-03	0.0E-01	1.1E-03
ASSP 4	1.3E+02	1.4E+02	1.2E+02	6.0E+01	5.9E+01	2.0E+01
	8.9E+00	5.2E+00	3.7E+00	2.3E+00	1.9E+00	1.8E+00
	1.7E+00	1.3E+00	1.2E+00			
0132 1220	8.8E-01	2.6E-01	3.6E-02	4.4E-03	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.2E+02	1.2E+02	6.3E+01	6.4E+01	2.2E+01
	1.1E+01	6.6E+00	3.7E+00	2.4E+00	2.0E+00	1.9E+00
	1.6E+00	1.4E+00	1.4E+00			
0133 1132	1.2E+00	3.0E-01	4.8E-02	0.0E-01	0.0E-01	6.3E-04
ASSP 4	2.2E+02	1.7E+02	1.2E+02	5.5E+01	5.0E+01	1.6E+01
	1.0E+01	6.2E+00	4.2E+00	2.9E+00	2.5E+00	2.4E+00
	2.0E+00	2.1E+00	2.0E+00			
0134 1264	1.4E+00	2.0E-01	1.7E-02	2.0E-03	6.9E-04	5.1E-04
ASSP 4	2.6E+02	1.7E+02	1.1E+02	5.5E+01	5.3E+01	1.9E+01
	1.3E+01	7.3E+00	4.6E+00	2.8E+00	2.3E+00	1.9E+00
	1.9E+00	1.8E+00	1.7E+00			
0135 1127	1.2E+00	2.7E-01	1.5E-02	2.3E-03	0.0E-01	5.7E-04
ASSP 4	3.8E+01	1.9E+02	1.2E+02	5.9E+01	5.5E+01	1.8E+01
	1.1E+01	6.7E+00	4.3E+00	2.8E+00	2.1E+00	2.0E+00
	1.8E+00	1.7E+00	1.6E+00			
0136 1125	1.3E+00	2.7E-01	1.2E-02	3.7E-03	1.6E-03	6.0E-04
ASSP 4	1.2E+01	1.6E+02	1.1E+02	6.4E+01	6.0E+01	3.1E+01
	2.2E+01	1.2E+01	6.9E+00	3.3E+00	1.9E+00	1.9E+00
	1.6E+00	1.5E+00	1.3E+00			

0137 1116	1.4E+00	2.4E-01	1.5E-02	3.3E-03	7.4E-04	0.0E-01
ASSP 4	3.8E+02	1.7E+02	1.1E+02	6.1E+01	5.6E+01	2.6E+01
	1.7E+01	1.0E+01	7.0E+00	3.9E+00	2.6E+00	2.3E+00
	1.6E+00	1.4E+00	1.5E+00			
0138 1050	8.4E-01	2.8E-01	1.5E-02	2.3E-03	0.0E-01	0.0E-01
ASSP 4	2.8E+02	1.5E+02	1.1E+02	6.1E+01	6.0E+01	2.8E+01
	1.7E+01	1.1E+01	7.1E+00	3.6E+00	2.8E+00	2.2E+00
	2.0E+00	1.7E+00	1.7E+00			
0139 1079	8.3E-01	2.6E-01	1.4E-02	5.2E-03	7.1E-04	0.0E-01
ASSP 4	2.4E+02	1.4E+02	1.1E+02	6.2E+01	5.8E+01	3.3E+01
	2.2E+01	1.4E+01	8.2E+00	4.0E+00	2.6E+00	2.5E+00
	1.9E+00	1.6E+00	1.3E+00			
0140 1119	7.1E-01	2.3E-01	2.7E-02	0.0E-01	7.5E-04	0.0E-01
ASSP 4	1.1E+02	1.2E+02	1.1E+02	6.0E+01	6.0E+01	3.7E+01
	3.0E+01	1.8E+01	1.1E+01	5.6E+00	3.8E+00	3.2E+00
	2.6E+00	2.0E+00	1.7E+00			
0141 959	8.1E-01	2.3E-01	4.5E-02	1.1E-03	0.0E-01	0.0E-01
ASSP 4	2.2E+02	1.5E+02	1.1E+02	5.9E+01	5.7E+01	3.4E+01
	2.8E+01	1.7E+01	1.0E+01	5.4E+00	3.9E+00	3.3E+00
	2.2E+00	2.2E+00	1.9E+00			
0142 1019	1.6E+00	4.5E-01	7.2E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+02	1.4E+02	1.1E+02	5.9E+01	5.8E+01	2.9E+01
	2.2E+01	1.4E+01	9.1E+00	4.8E+00	4.1E+00	3.5E+00
	3.1E+00	2.4E+00	2.2E+00			
0143 912	1.4E+00	3.8E-01	6.4E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.5E+02	1.4E+02	1.1E+02	5.8E+01	5.7E+01	2.9E+01
	2.3E+01	1.4E+01	8.1E+00	4.7E+00	3.8E+00	3.3E+00
	2.7E+00	2.6E+00	2.2E+00			
0144 676	1.3E+00	5.0E-01	7.6E-02	0.0E-01	0.0E-01	5.8E-04
ASSP 4	2.6E+02	1.9E+02	1.1E+02	5.8E+01	5.1E+01	2.2E+01
	1.6E+01	9.2E+00	6.2E+00	3.8E+00	3.1E+00	2.8E+00
	2.4E+00	2.1E+00	2.0E+00			
0145 868	2.6E+00	6.7E-01	6.3E-02	3.4E-03	7.8E-04	1.1E-03
ASSP 4	3.6E+02	3.7E+01	1.2E+02	6.2E+01	5.4E+01	2.2E+01
	1.5E+01	9.4E+00	5.8E+00	3.6E+00	3.4E+00	3.2E+00
	3.1E+00	2.6E+00	2.5E+00			
0146 798	2.5E+00	7.7E-01	1.1E-01	1.2E-03	8.2E-04	6.1E-04
ASSP 4	1.4E+01	1.6E+02	1.3E+02	6.5E+01	5.1E+01	2.1E+01
	1.3E+01	6.7E+00	4.6E+00	3.0E+00	2.5E+00	2.4E+00
	2.1E+00	1.8E+00	1.7E+00			
0147 739	1.4E+00	6.4E-01	9.2E-02	1.3E-03	0.0E-01	6.3E-04
ASSP 4	2.4E+01	1.1E+01	2.6E+00	6.9E+01	5.3E+01	2.1E+01
	1.3E+01	7.8E+00	4.9E+00	2.8E+00	2.4E+00	2.1E+00
	1.7E+00	1.9E+00	1.5E+00			
0148 585	1.8E+00	6.5E-01	7.3E-02	2.2E-03	0.0E-01	1.1E-03
ASSP 4	2.8E+02	2.0E+02	2.6E+00	6.8E+01	5.3E+01	1.9E+01
	1.2E+01	7.7E+00	5.3E+00	3.8E+00	3.0E+00	2.5E+00
	2.2E+00	2.1E+00	2.0E+00			
0149 534	2.8E+00	7.8E-01	7.6E-02	1.2E-03	0.0E-01	1.2E-03
ASSP 4	2.3E+02	4.8E+01	1.3E+02	6.8E+01	5.9E+01	2.5E+01
	1.6E+01	1.0E+01	6.7E+00	5.1E+00	4.0E+00	3.7E+00
	3.6E+00	3.3E+00	2.9E+00			

0150 784	2.3E+00	8.5E-01	9.0E-02	1.1E-03	0.0E-01	5.6E-04
ASSP 4	2.2E+02	1.7E+02	1.2E+02	7.0E+01	6.5E+01	2.6E+01
	1.8E+01	1.1E+01	6.9E+00	5.0E+00	4.5E+00	4.0E+00
	3.7E+00	3.2E+00	3.2E+00			
0151 734	2.3E+00	7.8E-01	9.8E-02	1.1E-03	1.5E-03	0.0E-01
ASSP 4	3.9E+02	1.2E+01	1.3E+02	7.0E+01	6.4E+01	2.6E+01
	1.8E+01	1.1E+01	7.1E+00	4.6E+00	4.2E+00	3.8E+00
	3.7E+00	3.4E+00	3.2E+00			
0152 795	2.6E+00	8.6E-01	6.4E-02	0.0E-01	0.0E-01	5.8E-04
ASSP 4	3.3E+02	2.0E+02	1.3E+02	6.8E+01	6.0E+01	2.7E+01
	1.9E+01	1.2E+01	7.5E+00	4.6E+00	4.0E+00	3.9E+00
	3.6E+00	3.4E+00	3.4E+00			
0153 876	1.6E+00	5.0E-01	4.0E-02	2.4E-03	0.0E-01	5.9E-04
ASSP 4	9.9E+01	3.2E+01	5.9E+00	7.6E+01	6.8E+01	2.8E+01
	1.5E+01	9.1E+00	6.6E+00	4.3E+00	3.7E+00	3.5E+00
	2.6E+00	2.8E+00	2.6E+00			
0154 973	1.2E+00	4.4E-01	4.0E-02	3.7E-03	8.3E-04	6.1E-04
ASSP 4	3.0E+02	8.5E+01	3.8E+00	7.4E+01	6.3E+01	2.5E+01
	1.5E+01	8.4E+00	5.4E+00	3.3E+00	3.2E+00	2.5E+00
	2.4E+00	2.2E+00	2.1E+00			
0155 1218	1.5E+00	4.3E-01	2.0E-02	1.3E-03	8.9E-04	6.5E-04
ASSP 4	3.2E+02	3.6E+01	1.3E+02	6.9E+01	6.1E+01	2.3E+01
	1.3E+01	7.6E+00	4.7E+00	3.3E+00	2.6E+00	2.4E+00
	2.2E+00	1.8E+00	2.2E+00			
0156 1189	1.4E+00	2.6E-01	7.0E-03	4.9E-03	0.0E-01	0.0E-01
ASSP 4	3.2E+02	3.5E+01	1.3E+02	5.9E+01	4.9E+01	1.6E+01
	8.3E+00	4.5E+00	3.6E+00	2.5E+00	2.1E+00	2.1E+00
	2.0E+00	1.7E+00	1.7E+00			
0157 1342	1.2E+00	2.3E-01	8.3E-03	2.2E-03	0.0E-01	5.4E-04
ASSP 4	1.6E+02	1.8E+02	1.2E+02	6.7E+01	6.2E+01	2.3E+01
	1.2E+01	6.6E+00	4.1E+00	2.2E+00	2.1E+00	2.0E+00
	1.8E+00	1.7E+00	1.7E+00			
0158 1064	1.3E+00	2.8E-01	9.8E-03	0.0E-01	8.8E-04	0.0E-01
ASSP 4	1.6E+02	1.7E+02	1.1E+02	6.2E+01	6.1E+01	1.9E+01
	9.0E+00	5.5E+00	3.8E+00	2.4E+00	2.2E+00	1.9E+00
	2.3E+00	2.2E+00	1.8E+00			
0159 1111	1.1E+00	3.3E-01	1.4E-02	3.7E-03	0.0E-01	6.1E-04
ASSP 4	3.7E+02	1.5E+01	1.3E+02	6.6E+01	6.0E+01	2.4E+01
	9.3E+00	6.0E+00	4.2E+00	2.6E+00	2.3E+00	2.1E+00
	2.2E+00	1.8E+00	2.0E+00			
0200 1430	2.2E+00	2.0E-01	1.3E-02	6.6E-03	1.8E-03	0.0E-01
ASSP 4	2.1E+02	1.5E+02	1.2E+02	7.0E+01	6.5E+01	2.9E+01
	1.3E+01	7.3E+00	5.8E+00	3.3E+00	3.0E+00	2.8E+00
	2.4E+00	2.6E+00	2.2E+00			
0201 1077	1.1E+00	1.8E-01	2.4E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 4	2.3E+02	4.9E+01	1.3E+02	6.9E+01	6.0E+01	2.2E+01
	9.2E+00	5.4E+00	4.1E+00	3.1E+00	2.3E+00	2.1E+00
	2.2E+00	1.9E+00	1.9E+00			
0202 1088	1.3E+00	2.3E-01	7.1E-03	1.2E-03	0.0E-01	6.2E-04
ASSP 4	1.3E+02	1.3E+02	1.2E+02	7.4E+01	7.8E+01	2.9E+01
	1.5E+01	8.5E+00	5.9E+00	3.3E+00	3.1E+00	2.7E+00
	2.4E+00	2.6E+00	2.4E+00			

0203 1164	1.7E+00	2.8E-01	1.0E-02	2.6E-03	8.9E-04	6.5E-04
ASSP 4	8.3E+01	1.2E+02	1.2E+02	7.9E+01	8.6E+01	3.1E+01
	1.5E+01	8.9E+00	6.1E+00	3.4E+00	2.8E+00	3.0E+00
	2.6E+00	2.3E+00	2.4E+00			
0204 1184	1.3E+00	2.5E-01	1.1E-02	3.6E-03	0.0E-01	0.0E-01
ASSP 4	6.0E+01	9.8E+01	1.1E+02	7.3E+01	7.9E+01	3.2E+01
	1.6E+01	8.6E+00	5.7E+00	3.1E+00	2.2E+00	2.3E+00
	2.2E+00	2.1E+00	1.9E+00			
0205 1362	1.2E+00	2.3E-01	1.3E-02	2.7E-03	0.0E-01	0.0E-01
ASSP 4	1.1E+02	1.2E+02	1.2E+02	7.0E+01	7.2E+01	2.9E+01
	1.3E+01	7.9E+00	5.0E+00	3.0E+00	2.1E+00	1.9E+00
	2.1E+00	2.0E+00	1.8E+00			
0206 1334	1.5E+00	1.7E-01	9.3E-03	0.0E-01	0.0E-01	6.1E-04
ASSP 4	1.1E+02	1.2E+02	1.2E+02	7.1E+01	7.7E+01	3.1E+01
	1.6E+01	9.0E+00	6.0E+00	3.2E+00	2.5E+00	2.4E+00
	2.2E+00	2.0E+00	2.0E+00			
0207 1446	1.6E+00	1.7E-01	2.5E-03	4.0E-03	1.8E-03	1.3E-03
ASSP 4	1.4E+02	1.1E+02	1.2E+02	8.1E+01	8.6E+01	3.8E+01
	1.6E+01	9.1E+00	5.9E+00	2.6E+00	2.2E+00	1.8E+00
	1.6E+00	1.6E+00	1.5E+00			
0208 1608	1.0E+00	1.7E-01	8.0E-03	1.4E-03	9.5E-04	7.0E-04
ASSP 4	1.1E+02	1.1E+02	1.1E+02	6.7E+01	7.0E+01	3.1E+01
	1.1E+01	6.9E+00	4.5E+00	2.2E+00	2.0E+00	1.7E+00
	1.5E+00	1.5E+00	1.3E+00			
0209 1288	7.9E-01	8.7E-02	5.1E-03	4.0E-03	0.0E-01	0.0E-01
ASSP 4	2.9E+02	1.5E+02	1.2E+02	7.0E+01	6.9E+01	3.0E+01
	9.7E+00	6.0E+00	4.1E+00	1.9E+00	1.6E+00	1.6E+00
	1.3E+00	1.4E+00	9.5E-01			
0210 1256	1.1E+00	1.5E-01	1.0E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 4	1.0E+02	1.9E+02	1.2E+02	6.9E+01	6.3E+01	3.0E+01
	1.0E+01	6.5E+00	4.6E+00	2.3E+00	1.5E+00	1.4E+00
	1.4E+00	1.3E+00	1.1E+00			
0211 1656	1.4E+00	1.6E-01	8.0E-03	2.8E-03	9.5E-04	0.0E-01
ASSP 4	8.6E+01	9.1E+01	1.2E+02	6.9E+01	6.1E+01	2.5E+01
	9.1E+00	5.1E+00	3.3E+00	2.1E+00	1.4E+00	1.1E+00
	9.8E-01	1.1E+00	1.0E+00			

0212 1630	1.1E+00	1.5E-01	2.3E-03	1.2E-03	0.0E-01	5.9E-04
ASSP 3	1.0E+00	2.9E+00	2.5E+00	2.1E+00	2.4E+00	2.2E+00
	1.7E+00	1.1E+00	5.3E-01	1.9E-01	4.3E-02	2.1E-02
	3.0E-03	0.0E-01	0.0E-01			
0213 1562	1.1E+00	1.7E-01	8.1E-03	1.4E-03	0.0E-01	0.0E-01
ASSP 3	1.5E+00	4.7E+00	3.0E+00	2.0E+00	2.1E+00	2.2E+00
	1.4E+00	8.4E-01	4.3E-01	1.0E-01	2.7E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0214 1885	9.2E-01	5.5E-02	2.5E-03	1.3E-03	0.0E-01	0.0E-01
ASSP 3	1.5E+00	3.7E+00	1.9E+00	1.3E+00	1.5E+00	1.2E+00
	6.7E-01	3.6E-01	1.2E-01	5.8E-02	9.1E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0215 1779	7.8E-01	1.2E-01	5.1E-03	1.3E-03	0.0E-01	2.0E-03
ASSP 3	1.5E+00	3.7E+00	1.9E+00	1.2E+00	1.3E+00	9.3E-01
	6.0E-01	3.7E-01	1.0E-01	4.9E-02	9.1E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			

0216 1883	7.4E-01	5.9E-02	0.0E-01	1.3E-03	1.7E-03	0.0E-01
ASSP 3	1.7E+00	3.2E+00	2.3E+00	1.4E+00	1.6E+00	1.3E+00
	7.6E-01	4.8E-01	2.0E-01	1.1E-01	2.4E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0217 2152	8.3E-01	9.9E-02	2.5E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.2E+00	4.3E+00	2.4E+00	1.3E+00	1.3E+00	1.1E+00
	8.1E-01	4.5E-01	2.1E-01	5.8E-02	2.7E-02	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0218 2439	8.8E-01	9.0E-02	2.4E-03	2.6E-03	0.0E-01	0.0E-01
ASSP 3	3.4E+00	2.5E+00	1.4E+00	9.4E-01	1.0E+00	7.5E-01
	5.0E-01	2.5E-01	1.5E-01	4.0E-02	9.1E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0219 2192	7.8E-01	8.6E-02	2.6E-03	2.7E-03	1.8E-03	6.7E-04
ASSP 3	3.7E+00	2.9E+00	1.8E+00	8.2E-01	9.1E-01	6.6E-01
	3.7E-01	2.3E-01	9.4E-02	3.6E-02	9.1E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0220 2725	1.2E+00	8.8E-02	5.2E-03	1.4E-03	2.8E-03	0.0E-01
ASSP 3	3.9E+00	3.3E+00	1.9E+00	1.0E+00	9.9E-01	9.1E-01
	4.8E-01	2.7E-01	1.2E-01	4.9E-02	9.1E-03	6.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0221 3873	8.0E-01	8.8E-02	0.0E-01	1.4E-03	0.0E-01	6.8E-04
ASSP 3	4.2E+00	2.7E+00	1.4E+00	9.6E-01	1.1E+00	7.7E-01
	3.8E-01	2.6E-01	6.1E-02	1.8E-02	6.1E-03	9.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0222 4503	7.4E-01	6.7E-02	0.0E-01	0.0E-01	8.6E-04	0.0E-01
ASSP 3	1.9E+00	9.1E-01	5.0E-01	4.1E-01	4.1E-01	2.7E-01
	1.1E-01	4.9E-02	1.5E-02	9.1E-03	0.0E-01	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0223 5118	7.3E-01	3.3E-02	0.0E-01	3.4E-03	0.0E-01	1.1E-03
ASSP 3	1.1E+00	4.0E-01	2.3E-01	2.4E-01	2.0E-01	1.2E-01
	4.9E-02	3.3E-02	1.2E-02	0.0E-01	0.0E-01	0.0E-01
	3.0E-03	0.0E-01	3.0E-03			
0224 4893	3.3E-01	2.9E-02	4.8E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	5.6E-01	1.1E-01	6.1E-02	3.5E-02	2.4E-02	1.7E-02
	2.9E-03	6.1E-03	6.1E-03	3.0E-03	3.0E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0225 3718	6.1E-01	8.3E-02	0.0E-01	1.3E-03	0.0E-01	0.0E-01
ASSP 3	7.3E-01	1.6E-01	6.4E-02	2.9E-02	3.0E-03	5.5E-03
	8.7E-03	3.0E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	3.0E-03	0.0E-01	0.0E-01			
0226 3491	7.7E-01	5.0E-02	0.0E-01	3.6E-03	0.0E-01	0.0E-01
ASSP 3	1.9E+00	5.0E-01	1.5E-01	1.1E-01	7.9E-02	4.4E-02
	3.5E-02	1.5E-02	3.0E-03	6.1E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0227 4248	3.1E-01	8.2E-02	0.0E-01	1.2E-03	0.0E-01	1.2E-03
ASSP 3	3.0E+00	1.1E+00	4.5E-01	2.9E-01	3.2E-01	1.7E-01
	1.1E-01	4.6E-02	2.1E-02	6.1E-03	3.0E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0228 4472	9.1E-01	4.4E-02	2.0E-03	0.0E-01	7.2E-04	5.3E-04
ASSP 3	1.9E+00	6.9E-01	2.7E-01	2.0E-01	1.8E-01	1.4E-01
	6.1E-02	2.4E-02	9.1E-03	9.1E-03	0.0E-01	6.1E-03
	0.0E-01	0.0E-01	0.0E-01			

0229 5039	4.1E-01	3.8E-02	0.0E-01	2.6E-03	8.7E-04	0.0E-01
ASSP 3	1.7E+00	6.3E-01	2.8E-01	1.5E-01	1.6E-01	9.4E-02
	4.1E-02	2.4E-02	9.1E-03	6.1E-03	3.0E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0230 5685	1.0E+00	4.3E-02	0.0E-01	1.2E-03	8.3E-04	6.1E-04
ASSP 3	7.4E-01	3.1E-01	1.1E-01	5.8E-02	6.1E-02	2.2E-02
	1.4E-02	1.2E-02	3.0E-03	0.0E-01	0.0E-01	3.0E-03
	0.0E-01	3.0E-03	0.0E-01			
0231 5470	3.1E-01	5.4E-02	0.0E-01	1.2E-03	7.8E-04	0.0E-01
ASSP 3	4.2E-01	1.8E-01	7.2E-02	2.3E-02	3.0E-02	1.9E-02
	1.4E-02	1.5E-02	0.0E-01	3.0E-03	6.1E-03	0.0E-01
	3.0E-03	0.0E-01	0.0E-01			
0232 5052	3.6E-01	5.3E-02	2.2E-03	1.1E-03	7.7E-04	5.7E-04
ASSP 3	2.6E-01	1.2E-01	4.9E-02	2.9E-02	1.8E-02	2.5E-02
	8.7E-03	9.1E-03	9.1E-03	3.0E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	3.0E-03			
0233 5652	4.9E-01	6.6E-02	1.9E-03	1.0E-03	0.0E-01	5.1E-04
ASSP 3	7.2E-01	2.0E-01	1.7E-01	6.9E-02	9.7E-02	6.6E-02
	3.2E-02	1.2E-02	6.1E-03	0.0E-01	6.1E-03	0.0E-01
	3.0E-03	0.0E-01	0.0E-01			
0234 6362	3.0E-01	1.7E-02	1.8E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	9.0E-01	2.3E-01	2.1E-01	1.0E-01	1.6E-01	9.4E-02
	4.9E-02	2.1E-02	1.2E-02	0.0E-01	3.0E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0235 6000	1.3E-01	1.9E-02	0.0E-01	8.3E-04	0.0E-01	0.0E-01
ASSP 3	4.0E-01	1.2E-01	9.8E-02	5.5E-02	4.6E-02	3.0E-02
	2.9E-02	9.1E-03	6.1E-03	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0236 4687	7.3E-02	8.1E-03	1.3E-03	0.0E-01	0.0E-01	3.4E-04
ASSP 3	2.3E-01	1.1E-01	5.5E-02	1.7E-02	1.8E-02	5.5E-03
	5.8E-03	6.1E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	3.0E-03	0.0E-01			
0237 1987	3.4E-02	1.1E-02	0.0E-01	6.3E-04	0.0E-01	0.0E-01
ASSP 3	9.7E-01	4.9E-01	1.4E-01	6.7E-02	4.3E-02	2.2E-02
	3.2E-02	6.1E-03	1.2E-02	0.0E-01	0.0E-01	0.0E-01
	3.0E-03	0.0E-01	0.0E-01			
0238 1426	2.2E-01	6.5E-02	2.7E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	2.2E+00	2.9E+00	1.7E+00	8.1E-01	7.4E-01	6.4E-01
	5.1E-01	3.6E-01	2.6E-01	1.4E-01	4.0E-02	1.8E-02
	6.1E-03	0.0E-01	0.0E-01			
0239 1268	1.6E+00	2.3E-01	1.1E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.4E+00	4.3E+00	4.9E+00	3.1E+00	3.5E+00	3.0E+00
	2.4E+00	1.7E+00	1.1E+00	4.8E-01	1.4E-01	5.5E-02
	6.1E-03	3.0E-03	0.0E-01			
0240 1526	8.8E-01	1.1E-01	1.5E-03	0.0E-01	0.0E-01	0.0E-01
ASSP 3	7.1E-01	3.0E+00	2.9E+00	2.3E+00	2.7E+00	2.3E+00
	1.7E+00	1.1E+00	4.2E-01	1.2E-01	3.6E-02	9.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0241 1185	9.4E-01	8.6E-02	1.4E-03	1.5E-03	5.0E-04	0.0E-01
ASSP 3	6.4E-01	3.0E+00	2.1E+00	2.2E+00	2.6E+00	2.0E+00
	1.5E+00	7.2E-01	2.6E-01	7.6E-02	1.2E-02	1.2E-02
	0.0E-01	0.0E-01	0.0E-01			

0242 2175	8.8E-01	1.7E-01	6.0E-03	2.4E-03	0.0E-01	3.9E-04
ASSP 3	6.7E-01	3.7E+00	3.3E+00	3.2E+00	3.5E+00	2.8E+00
	1.8E+00	1.1E+00	4.9E-01	1.3E-01	4.0E-02	9.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0243 2766	1.2E+00	7.8E-02	3.4E-03	1.8E-03	0.0E-01	0.0E-01
ASSP 3	1.8E-01	1.4E+00	2.3E+00	2.7E+00	2.7E+00	2.0E+00
	1.1E+00	5.5E-01	1.7E-01	2.1E-02	3.0E-03	0.0E-01
	0.0E-01	3.0E-03	0.0E-01			
0244 2648	1.9E-01	5.6E-02	1.7E-03	2.6E-03	0.0E-01	0.0E-01
ASSP 3	2.3E-01	1.1E+00	1.1E+00	1.1E+00	1.0E+00	5.6E-01
	2.0E-01	5.5E-02	1.2E-02	0.0E-01	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0245 1043	3.4E-01	4.7E-02	0.0E-01	2.7E-03	6.1E-04	0.0E-01
ASSP 3	6.5E-02	1.0E+00	1.9E+00	2.3E+00	2.0E+00	7.9E-01
	2.0E-01	1.8E-02	3.0E-03	3.0E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0246 1137	9.2E-01	1.2E-01	1.9E-03	2.0E-03	1.4E-03	0.0E-01
ASSP 3	1.7E-01	1.9E+00	3.4E+00	4.4E+00	5.6E+00	4.2E+00
	1.9E+00	8.0E-01	1.9E-01	1.2E-02	0.0E-01	0.0E-01
	0.0E-01	3.0E-03	0.0E-01			
0247 1177	1.4E+00	9.3E-02	3.6E-03	0.0E-01	1.3E-03	0.0E-01
ASSP 3	1.4E-01	2.3E+00	4.0E+00	5.0E+00	6.0E+00	4.4E+00
	2.1E+00	8.8E-01	1.8E-01	2.1E-02	6.1E-03	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0248 1052	7.9E-01	1.2E-01	1.9E-03	3.0E-03	0.0E-01	0.0E-01
ASSP 3	9.7E-01	4.3E+00	4.4E+00	3.7E+00	4.0E+00	2.7E+00
	1.2E+00	4.8E-01	1.0E-01	1.5E-02	6.1E-03	3.0E-03
	0.0E-01	0.0E-01	0.0E-01			
0249 790	1.4E+00	1.3E-01	8.4E-03	1.1E-03	7.5E-04	5.5E-04
ASSP 3	8.6E-01	3.1E+00	3.5E+00	3.5E+00	4.0E+00	3.3E+00
	1.9E+00	1.2E+00	5.6E-01	1.9E-01	4.6E-02	6.1E-03
	0.0E-01	0.0E-01	3.0E-03			
0250 589	2.6E+00	4.8E-01	1.6E-02	1.9E-03	6.5E-04	0.0E-01
ASSP 3	3.5E-02	5.3E-01	2.2E+00	6.1E+00	9.8E+00	9.7E+00
	7.2E+00	4.8E+00	2.4E+00	6.7E-01	9.4E-02	2.7E-02
	0.0E-01	3.0E-03	0.0E-01			
0251 588	3.4E+00	7.0E-01	7.7E-03	4.0E-03	6.8E-04	0.0E-01
ASSP 3	2.2E-02	3.1E-01	1.9E+00	6.6E+00	1.3E+01	1.3E+01
	9.9E+00	6.6E+00	2.6E+00	5.7E-01	4.3E-02	6.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0252 583	3.2E+00	5.0E-01	1.6E-02	2.9E-03	6.5E-04	4.8E-04
ASSP 3	1.7E-02	3.3E-01	1.9E+00	6.4E+00	1.1E+01	1.3E+01
	1.0E+01	7.3E+00	3.4E+00	8.4E-01	1.0E-01	9.1E-03
	3.0E-03	0.0E-01	0.0E-01			
0253 545	4.2E+00	8.5E-01	2.1E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.3E-02	6.4E-01	2.4E+00	6.4E+00	1.1E+01	1.2E+01
	9.8E+00	7.5E+00	4.0E+00	1.3E+00	1.9E-01	6.1E-03
	3.0E-03	3.0E-03	0.0E-01			
0254 463	5.5E+00	1.2E+00	4.9E-02	0.0E-01	7.0E-04	0.0E-01
ASSP 3	8.7E-03	1.7E-01	1.5E+00	6.1E+00	1.1E+01	1.4E+01
	1.2E+01	1.0E+01	5.8E+00	2.5E+00	4.2E-01	2.1E-02
	6.1E-03	3.0E-03	0.0E-01			

0255 476	3.5E+00	1.1E+00	5.8E-02	0.0E-01	0.0E-01	0.0E-
ASSP 3	8.7E-03	1.5E+00	2.6E+00	6.3E+00	9.1E+00	1.1E+
	9.9E+00	8.7E+00	5.6E+00	2.7E+00	7.2E-01	7.6E-
	1.8E-02	3.0E-03	0.0E-01			
0256 398	2.6E+00	8.1E-01	1.2E-01	1.1E-03	7.3E-04	0.0E-
ASSP 3	5.6E-02	5.8E+00	5.2E+00	5.7E+00	6.8E+00	6.9E+
	5.7E+00	5.9E+00	4.2E+00	2.9E+00	1.5E+00	5.2E-
	5.5E-02	1.5E-02	3.0E-03			
0257 383	2.4E+00	1.1E+00	1.4E-01	2.1E-03	7.0E-04	0.0E-
ASSP 3	8.3E-02	2.0E+00	3.4E+00	5.9E+00	7.4E+00	7.4E+
	6.6E+00	6.3E+00	5.5E+00	4.0E+00	2.1E+00	8.3E-
	1.8E-01	1.5E-02	3.0E-03			
0258 413	2.8E+00	9.1E-01	6.4E-02	9.7E-04	6.5E-04	0.0E-
ASSP 3	2.6E-02	5.9E-01	2.2E+00	5.7E+00	9.2E+00	1.0E+
	9.1E+00	8.8E+00	6.8E+00	4.4E+00	2.2E+00	6.4E-
	1.5E-01	2.4E-02	0.0E-01			
0259 431	2.9E+00	9.8E-01	8.7E-02	1.0E-03	1.4E-03	5.0E-
ASSP 3	3.0E-02	3.6E-01	1.9E+00	6.3E+00	1.0E+01	1.1E+
	9.4E+00	8.4E+00	6.5E+00	3.4E+00	1.3E+00	3.5E-
	4.3E-02	9.1E-03	0.0E-01			
0300 371	3.4E+00	9.2E-01	5.3E-02	2.0E-03	2.0E-03	0.0E-
ASSP 3	2.2E-02	4.4E-01	2.0E+00	6.8E+00	1.1E+01	1.1E+
	1.0E+01	8.3E+00	5.5E+00	2.4E+00	7.0E-01	1.3E-
	1.8E-02	6.1E-03	0.0E-01			
0301 423	3.8E+00	1.2E+00	3.6E-02	1.9E-03	0.0E-01	9.4E-
ASSP 3	1.3E-02	3.0E-01	1.6E+00	6.1E+00	1.1E+01	1.2E+
	1.1E+01	9.1E+00	5.6E+00	2.3E+00	5.3E-01	7.0E-
	1.2E-02	6.1E-03	0.0E-01			
0302 476	2.7E+00	9.9E-01	4.8E-02	9.1E-04	6.2E-04	4.5E-
ASSP 3	2.6E-02	3.2E-01	2.1E+00	6.0E+00	1.1E+01	1.2E+
	1.1E+01	9.6E+00	6.5E+00	2.7E+00	5.5E-01	7.6E-
	1.5E-02	3.0E-03	3.0E-03			
0303 539	3.3E+00	9.0E-01	2.5E-02	0.0E-01	0.0E-01	0.0E-
ASSP 3	2.2E-02	8.5E-01	1.9E+00	4.2E+00	6.6E+00	7.6E+
	7.5E+00	7.3E+00	5.6E+00	2.3E+00	3.4E-01	3.6E-
	2.1E-02	9.1E-03	3.0E-03			
0304 507	2.6E+00	8.1E-01	3.1E-02	0.0E-01	0.0E-01	0.0E-
ASSP 3	8.7E-03	9.5E-01	2.2E+00	4.4E+00	6.0E+00	7.0E+
	7.0E+00	6.7E+00	5.5E+00	2.4E+00	5.4E-01	4.9E-
	9.1E-03	3.0E-03	0.0E-01			
0305 611	2.5E+00	8.0E-01	5.5E-02	0.0E-01	1.9E-03	0.0E-
ASSP 3	6.9E-02	2.9E+00	4.2E+00	5.9E+00	6.4E+00	5.8E+
	5.6E+00	5.8E+00	5.0E+00	2.6E+00	6.1E-01	7.9E-
	6.1E-03	3.0E-03	0.0E-01			
0306 833	2.2E+00	6.8E-01	7.3E-02	0.0E-01	0.0E-01	4.8E-
ASSP 3	1.4E-01	3.6E+00	4.5E+00	5.5E+00	5.7E+00	4.6E+
	4.0E+00	4.3E+00	3.9E+00	2.9E+00	9.4E-01	1.2E-
	2.7E-02	0.0E-01	3.0E-03			
0307 613	1.3E+00	3.1E-01	3.7E-02	0.0E-01	6.3E-04	0.0E-
ASSP 3	1.5E-01	4.7E+00	4.0E+00	4.5E+00	4.7E+00	3.1E+
	2.6E+00	2.8E+00	2.5E+00	1.8E+00	4.4E-01	2.4E-
	0.0E-01	9.1E-03	3.0E-03			

AD-A039 776 OFFICE OF NAVAL RESEARCH ARLINGTON VA F/G 4/2

MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)

1975 S G GATHMAN, R E LARSON

UNCLASSIFIED NL

5 OF 7

AD
A039 776

0308 764	1.1E+00	4.6E-01	2.5E-02	1.0E-03	6.9E-04	5.1E-04
ASSP 3	1.4E-01	5.1E+00	4.0E+00	5.3E+00	6.1E+00	4.9E+00
	3.9E+00	3.1E+00	2.9E+00	1.3E+00	1.5E-01	6.1E-03
	1.2E-02	6.1E-03	3.0E-03			
0309 915	1.5E+00	5.8E-01	3.6E-02	0.0E-01	0.0E-01	5.0E-04
ASSP 3	1.3E-01	4.1E+00	2.8E+00	3.9E+00	4.8E+00	4.4E+00
	3.8E+00	3.7E+00	3.2E+00	1.6E+00	4.5E-01	6.7E-02
	1.2E-02	6.1E-03	6.1E-03			
0310 863	1.6E+00	5.1E-01	4.5E-02	1.0E-03	0.0E-01	0.0E-01
ASSP 3	1.2E-01	2.4E+00	1.9E+00	2.7E+00	3.1E+00	2.9E+00
	2.5E+00	2.8E+00	2.7E+00	2.1E+00	8.5E-01	1.5E-01
	3.0E-02	3.0E-03	3.0E-03			
0311 863	1.7E+00	3.2E-01	4.5E-02	1.0E-03	6.9E-04	5.1E-04
ASSP 3	5.2E-02	3.8E+00	7.0E+00	8.4E+00	6.5E+00	3.1E+00
	2.2E+00	1.9E+00	1.8E+00	1.2E+00	3.7E-01	6.7E-02
	6.1E-03	3.0E-03	0.0E-01			
0312 899	1.5E+00	3.3E-01	2.9E-02	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.3E-01	4.5E+00	4.9E+00	5.1E+00	3.6E+00	2.6E+00
	2.4E+00	2.1E+00	2.2E+00	8.5E-01	1.3E-01	1.2E-02
	6.1E-03	3.0E-03	0.0E-01			
0313 1479	9.7E-01	3.2E-01	1.3E-02	1.0E-03	0.0E-01	5.0E-04
ASSP 3	3.9E-02	1.3E+00	1.5E+00	2.0E+00	2.7E+00	3.0E+00
	2.6E+00	2.3E+00	1.0E+00	2.3E-01	1.8E-02	3.0E-03
	3.0E-03	3.0E-03	3.0E-03			
0314 2939	5.5E-01	7.9E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	1.3E-02	4.9E-01	6.9E-01	1.1E+00	1.3E+00	1.1E+00
	8.3E-01	4.0E-01	6.4E-02	9.1E-03	0.0E-01	0.0E-01
	0.0E-01	0.0E-01	0.0E-01			
0315 2567	4.4E-01	6.1E-02	0.0E-01	1.0E-03	7.0E-04	5.2E-04
ASSP 3	1.7E-02	4.8E-01	4.9E-01	7.4E-01	8.5E-01	5.0E-01
	2.7E-01	4.3E-02	1.8E-02	6.1E-03	6.1E-03	3.0E-03
	0.0E-01	6.1E-03	0.0E-01			
0316 4286	2.6E-01	5.1E-02	1.8E-03	9.7E-04	0.0E-01	0.0E-01
ASSP 3	2.2E-02	2.3E-01	1.5E-01	1.4E-01	1.1E-01	5.3E-02
	1.7E-02	6.1E-03	9.1E-03	0.0E-01	0.0E-01	6.1E-03
	0.0E-01	0.0E-01	0.0E-01			
0317 4875	2.1E-01	3.5E-02	0.0E-01	0.0E-01	0.0E-01	0.0E-01
ASSP 3	4.3E-03	7.9E-02	2.9E-02	1.2E-02	6.1E-03	2.8E-03
	0.0E-01	3.0E-03	6.1E-03	0.0E-01	0.0E-01	3.0E-03
	0.0E-01	6.1E-03	0.0E-01			

Fog 15. August 11 (Day 223) 1975

DAY 223 NUMBER DENSITY (NO./CC/MICRON)

HOUR VSBY 1ST LINE = DAP LINES 2,3&4 = ASSP

HOUR	VSBY						
0745	9499	4.1E-01	5.8E-02	2.1E-03	1.1E-03	0.0E-01	1.1E-03
ASSP	3	8.7E-02	6.8E-02	2.6E-02	5.8E-03	3.0E-03	0.0E-01
		0.0E-01	0.0E-01	0.0E-01	0.0E-01	3.0E-03	0.0E-01
		0.0E-01	0.0E-01	0.0E-01			
0746	9606	3.8E-01	4.8E-02	5.2E-03	1.1E-03	3.7E-04	5.4E-04
ASSP	3	3.5E-02	6.4E-02	8.7E-03	5.8E-03	0.0E-01	0.0E-01
		2.9E-03	0.0E-01	0.0E-01	0.0E-01	0.0E-01	0.0E-01
		0.0E-01	0.0E-01	0.0E-01			
0747	4309	3.5E-01	4.4E-02	0.0E-01	9.3E-04	6.3E-04	4.6E-04
ASSP	3	5.6E-01	1.3E+00	1.3E-01	9.8E-02	1.0E-01	9.9E-02
		6.1E-02	1.5E-02	3.0E-02	3.3E-02	6.1E-03	2.1E-02
		3.0E-03	6.1E-03	0.0E-01			
0748	5387	2.6E-01	4.8E-02	9.2E-04	0.0E-01	3.3E-04	2.4E-04
ASSP	3	8.9E-01	1.8E+00	2.0E-01	1.5E-01	1.4E-01	9.7E-02
		6.4E-02	4.3E-02	4.3E-02	2.1E-02	9.1E-03	1.5E-02
		3.0E-03	3.0E-03	0.0E-01			
0749	5778	5.0E-01	7.1E-02	1.1E-03	1.1E-03	0.0E-01	0.0E-01
ASSP	3	2.3E-01	3.3E-01	5.8E-02	3.8E-02	3.6E-02	1.9E-02
		2.0E-02	9.1E-03	1.2E-02	6.1E-03	9.1E-03	0.0E-01
		3.0E-03	0.0E-01	0.0E-01			
0750	1258	7.5E-01	1.3E-01	1.4E-02	5.4E-04	3.7E-04	0.0E-01
ASSP	3	2.7E+00	9.6E+00	2.5E+00	2.6E+00	2.2E+00	1.8E+00
		1.4E+00	1.1E+00	7.5E-01	5.0E-01	4.3E-01	2.4E-01
		8.5E-02	8.2E-02	6.7E-02			
0751	745	1.8E+00	2.6E-01	2.0E-02	2.1E-03	7.1E-04	2.6E-04
ASSP	3	2.9E+00	1.9E+01	9.7E+00	7.5E+00	6.5E+00	6.1E+00
		4.6E+00	3.5E+00	2.7E+00	1.8E+00	1.1E+00	6.3E-01
		3.9E-01	2.8E-01	1.5E-01			
0752	543	2.6E+00	4.1E-01	2.8E-02	4.1E-03	4.0E-04	5.8E-04
ASSP	3	2.1E+00	1.7E+01	1.0E+01	8.1E+00	7.4E+00	6.2E+00
		5.0E+00	4.4E+00	3.2E+00	2.2E+00	1.5E+00	9.3E-01
		6.1E-01	3.6E-01	2.2E-01			
0753	396	2.6E+00	4.6E-01	6.3E-02	3.2E-03	2.1E-03	1.0E-03
ASSP	3	1.3E+00	1.1E+01	8.2E+00	8.2E+00	8.3E+00	8.2E+00
		6.7E+00	5.9E+00	4.6E+00	3.3E+00	2.5E+00	1.6E+00
		1.2E+00	7.2E-01	4.7E-01			
0754	363	3.1E+00	7.7E-01	9.2E-02	5.9E-03	1.3E-03	0.0E-01
ASSP	3	2.2E-01	7.3E+00	7.8E+00	8.4E+00	1.0E+01	1.0E+01
		8.7E+00	8.5E+00	7.0E+00	5.0E+00	3.7E+00	2.5E+00
		1.7E+00	1.1E+00	7.8E-01			
0755	362	3.7E+00	8.3E-01	1.4E-01	8.3E-03	1.8E-03	1.8E-03
ASSP	3	3.6E-01	4.1E+00	6.1E+00	5.7E+00	8.9E+00	9.9E+00
		9.4E+00	8.9E+00	7.9E+00	5.8E+00	4.3E+00	3.1E+00
		2.2E+00	1.5E+00	8.9E-01			
0756	368	3.4E+00	7.1E-01	1.2E-01	7.8E-03	2.6E-03	1.4E-03
ASSP	3	3.5E-01	4.3E+00	4.8E+00	5.6E+00	8.1E+00	9.2E+00
		8.1E+00	7.9E+00	6.6E+00	5.1E+00	3.6E+00	2.6E+00
		1.8E+00	1.1E+00	7.9E-01			
0757	377	3.5E+00	7.6E-01	1.2E-01	6.0E-03	1.1E-03	1.9E-03
ASSP	3	8.1E-01	8.8E+00	7.2E+00	6.8E+00	8.4E+00	8.3E+00
		7.1E+00	6.6E+00	5.6E+00	4.1E+00	3.2E+00	2.1E+00
		1.6E+00	1.1E+00	6.7E-01			

0758 468	2.8E+00	6.1E-01	6.9E-02	1.1E-02	1.1E-03	1.1E-03
ASSP 3	8.2E-01	6.6E+00	7.4E+00	7.1E+00	8.4E+00	8.5E+00
	7.4E+00	6.7E+00	5.4E+00	4.0E+00	2.9E+00	2.0E+00
	1.2E+00	8.8E-01	5.8E-01			
0759 462	2.4E+00	5.1E-01	7.2E-02	2.8E-03	3.8E-04	2.8E-04
ASSP 3	3.4E+00	1.1E+01	7.9E+00	5.9E+00	7.2E+00	7.0E+00
	6.2E+00	5.2E+00	4.4E+00	3.0E+00	2.3E+00	1.6E+00
	1.1E+00	6.8E-01	4.8E-01			
0800 469	2.4E+00	5.9E-01	5.2E-02	6.7E-03	1.2E-03	6.1E-04
ASSP 3	1.0E+00	7.9E+00	6.6E+00	5.5E+00	7.5E+00	7.7E+00
	6.7E+00	6.0E+00	4.7E+00	3.5E+00	2.5E+00	1.6E+00
	1.1E+00	6.8E-01	4.9E-01			
0801 466	2.5E+00	4.4E-01	6.9E-02	9.0E-03	2.0E-03	1.5E-03
ASSP 3	6.6E-01	6.4E+00	7.5E+00	6.6E+00	8.6E+00	8.3E+00
	6.9E+00	5.9E+00	4.8E+00	3.4E+00	2.2E+00	1.6E+00
	1.0E+00	6.6E-01	4.3E-01			
0802 375	2.5E+00	5.5E-01	1.0E-01	7.2E-03	2.0E-03	5.9E-04
ASSP 3	1.9E+00	6.0E+00	6.1E+00	5.7E+00	8.2E+00	7.5E+00
	6.4E+00	5.6E+00	4.5E+00	3.1E+00	2.2E+00	1.5E+00
	8.9E-01	6.6E-01	3.5E-01			
0803 641	2.2E+00	3.9E-01	6.0E-02	6.0E-03	7.3E-04	8.1E-04
ASSP 3	1.3E+00	3.8E+00	4.9E+00	4.6E+00	7.1E+00	6.7E+00
	6.2E+00	5.2E+00	4.3E+00	3.2E+00	2.1E+00	1.4E+00
	8.8E-01	6.4E-01	4.1E-01			
0804 464	1.5E+00	3.7E-01	5.5E-02	4.2E-03	5.3E-03	1.5E-03
ASSP 3	4.2E+00	6.7E+00	5.1E+00	3.8E+00	4.5E+00	4.4E+00
	3.7E+00	3.1E+00	2.6E+00	1.9E+00	1.3E+00	8.1E-01
	6.2E-01	4.6E-01	2.8E-01			
0805 445	2.8E+00	5.7E-01	9.4E-02	8.9E-03	4.7E-03	3.2E-03
ASSP 3	1.6E+00	4.8E+00	5.8E+00	5.4E+00	7.6E+00	7.4E+00
	6.0E+00	5.2E+00	4.5E+00	2.9E+00	2.1E+00	1.3E+00
	9.3E-01	5.9E-01	4.4E-01			
0806 465	1.9E+00	5.0E-01	1.0E-01	1.1E-02	3.2E-03	3.9E-03
ASSP 3	4.1E+00	7.6E+00	7.2E+00	4.5E+00	5.7E+00	5.2E+00
	4.7E+00	4.0E+00	3.4E+00	2.4E+00	1.6E+00	1.1E+00
	7.3E-01	5.1E-01	3.3E-01			
0807 507	2.1E+00	5.0E-01	7.6E-02	5.5E-03	4.8E-03	1.4E-03
ASSP 3	2.1E+00	5.2E+00	6.0E+00	5.0E+00	5.8E+00	5.6E+00
	4.4E+00	3.8E+00	3.0E+00	2.2E+00	1.5E+00	1.1E+00
	6.4E-01	4.6E-01	3.2E-01			
0808 589	1.4E+00	4.1E-01	6.6E-02	7.1E-03	2.4E-03	3.2E-03
ASSP 3	6.1E-01	2.0E+00	3.5E+00	4.0E+00	5.9E+00	5.9E+00
	5.3E+00	4.1E+00	3.5E+00	2.5E+00	1.9E+00	1.3E+00
	8.0E-01	6.3E-01	4.8E-01			
0809 663	1.2E+00	3.3E-01	7.8E-02	5.6E-03	4.5E-03	2.2E-03
ASSP 3	1.4E+00	3.0E+00	3.8E+00	3.3E+00	4.7E+00	4.7E+00
	4.3E+00	3.9E+00	3.3E+00	2.3E+00	1.8E+00	1.4E+00
	8.7E-01	6.9E-01	4.6E-01			
0810 451	1.8E+00	6.8E-01	1.0E-01	1.6E-02	2.4E-03	2.6E-03
ASSP 3	1.9E+00	4.4E+00	4.4E+00	4.0E+00	5.4E+00	5.2E+00
	5.0E+00	4.5E+00	3.9E+00	2.8E+00	2.3E+00	1.6E+00
	1.2E+00	8.0E-01	4.6E-01			
0811 497	2.0E+00	5.5E-01	1.1E-01	1.7E-02	5.3E-03	2.1E-03
ASSP 3	2.0E+00	5.5E+00	5.8E+00	4.1E+00	5.2E+00	5.1E+00
	4.4E+00	3.9E+00	3.5E+00	2.5E+00	1.9E+00	1.3E+00
	9.8E-01	6.9E-01	4.0E-01			

0812 977	9.3E-01	2.9E-01	4.4E-02	7.3E-03	4.6E-03	3.4E-03
ASSP 3	2.8E+00	4.2E+00	3.5E+00	2.5E+00	2.8E+00	2.7E+00
	2.4E+00	2.4E+00	1.7E+00	1.3E+00	1.1E+00	7.5E-01
	5.1E-01	3.6E-01	2.4E-01			
0813 1370	1.1E+00	2.1E-01	4.1E-02	3.8E-03	2.1E-03	1.9E-03
ASSP 3	1.3E+00	1.1E+00	1.3E+00	1.6E+00	2.3E+00	2.4E+00
	2.1E+00	1.9E+00	1.8E+00	1.3E+00	1.0E+00	6.7E-01
	4.4E-01	3.9E-01	2.7E-01			
0814 732	9.8E-01	3.0E-01	3.6E-02	9.3E-03	2.0E-03	1.7E-03
ASSP 3	5.1E+00	4.7E+00	3.9E+00	2.5E+00	2.6E+00	2.5E+00
	2.1E+00	2.0E+00	1.7E+00	1.2E+00	9.4E-01	5.9E-01
	3.6E-01	2.8E-01	2.1E-01			
0815 581	1.8E+00	4.1E-01	6.6E-02	8.4E-03	2.4E-03	1.8E-03
ASSP 3	3.6E+00	3.7E+00	3.7E+00	3.0E+00	3.9E+00	4.0E+00
	3.4E+00	2.8E+00	2.5E+00	1.8E+00	1.2E+00	8.0E-01
	6.1E-01	4.2E-01	2.1E-01			
0816 658	1.4E+00	4.4E-01	6.0E-02	6.7E-03	1.9E-03	2.5E-03
ASSP 3	1.7E+00	3.3E+00	3.9E+00	3.4E+00	4.3E+00	4.2E+00
	3.5E+00	3.3E+00	2.5E+00	1.9E+00	1.2E+00	8.4E-01
	5.5E-01	3.8E-01	2.5E-01			
0817 811	1.5E+00	3.0E-01	6.3E-02	8.3E-03	1.6E-03	1.5E-03
ASSP 3	1.9E+00	2.9E+00	3.0E+00	3.3E+00	3.9E+00	3.7E+00
	3.0E+00	2.5E+00	2.0E+00	1.5E+00	1.0E+00	6.7E-01
	4.8E-01	2.8E-01	1.5E-01			
0818 819	1.2E+00	2.5E-01	3.6E-02	3.6E-03	2.5E-03	1.5E-03
ASSP 3	1.6E+00	1.9E+00	2.5E+00	2.9E+00	3.4E+00	3.2E+00
	2.7E+00	2.1E+00	1.6E+00	1.1E+00	7.7E-01	5.5E-01
	3.3E-01	2.3E-01	1.4E-01			
0819 2131	6.0E-01	1.2E-01	2.1E-02	2.9E-03	2.0E-03	8.8E-04
ASSP 3	4.2E-01	4.1E-01	6.1E-01	7.0E-01	9.5E-01	9.0E-01
	7.6E-01	6.3E-01	5.7E-01	4.2E-01	3.2E-01	2.0E-01
	1.1E-01	1.5E-01	5.5E-02			
0820 1632	8.4E-01	1.4E-01	2.3E-02	3.8E-03	2.1E-03	1.9E-03
ASSP 3	1.2E-01	1.9E-01	4.5E-01	6.6E-01	9.7E-01	8.2E-01
	7.7E-01	6.5E-01	6.1E-01	4.3E-01	3.3E-01	3.1E-01
	1.8E-01	1.5E-01	1.2E-01			
0821 1924	9.0E-01	1.8E-01	1.8E-02	3.8E-03	3.0E-03	3.1E-03
ASSP 3	1.4E+00	7.8E-01	8.8E-01	9.3E-01	9.3E-01	9.8E-01
	7.4E-01	7.3E-01	5.4E-01	4.7E-01	4.1E-01	3.3E-01
	3.2E-01	2.2E-01	1.7E-01			
0822 1223	7.7E-01	1.8E-01	2.1E-02	3.0E-03	4.9E-03	9.0E-04
ASSP 3	8.4E-01	6.6E-01	8.1E-01	9.2E-01	1.1E+00	9.6E-01
	7.8E-01	6.7E-01	6.0E-01	4.5E-01	2.9E-01	2.9E-01
	2.3E-01	1.8E-01	1.6E-01			
0823 1521	8.3E-01	1.7E-01	1.4E-02	4.9E-03	2.2E-03	1.1E-03
ASSP 3	3.0E+00	1.8E+00	1.0E+00	1.0E+00	1.1E+00	8.6E-01
	8.0E-01	6.7E-01	5.0E-01	4.3E-01	4.2E-01	3.1E-01
	2.2E-01	1.9E-01	1.4E-01			
0824 2868	4.0E-01	1.3E-01	9.1E-03	5.5E-03	1.9E-03	6.8E-04
ASSP 3	3.5E-01	1.8E-01	1.3E-01	2.3E-01	2.9E-01	3.0E-01
	2.1E-01	2.0E-01	2.1E-01	1.8E-01	2.1E-01	1.3E-01
	1.2E-01	1.4E-01	3.6E-02			
0825 2441	6.7E-01	1.5E-01	6.9E-03	4.8E-03	1.6E-03	1.2E-03
ASSP 3	1.3E-01	1.6E-01	1.7E-01	3.7E-01	3.4E-01	3.4E-01
	3.2E-01	2.8E-01	2.2E-01	1.8E-01	1.4E-01	1.1E-01
	7.0E-02	5.5E-02	6.4E-02			

0826 2060	5.9E-01	1.8E-01	1.7E-02	6.5E-03	1.8E-03	2.0E-03
ASSP 3	2.9E-01	2.4E-01	2.9E-01	5.0E-01	7.3E-01	6.5E-01
	5.4E-01	5.9E-01	4.6E-01	3.5E-01	3.0E-01	2.5E-01
	2.0E-01	1.3E-01	9.7E-02			
0827 2628	7.1E-01	1.7E-01	1.5E-02	3.6E-03	4.1E-03	1.5E-03
ASSP 3	7.6E-01	4.5E-01	3.9E-01	3.4E-01	5.0E-01	3.3E-01
	3.8E-01	3.0E-01	3.0E-01	2.3E-01	1.8E-01	1.6E-01
	1.3E-01	1.1E-01	8.5E-02			
0828 1713	6.8E-01	1.9E-01	2.2E-02	4.7E-03	2.8E-03	2.0E-03
ASSP 3	2.0E+00	9.3E-01	9.2E-01	8.1E-01	1.0E+00	7.8E-01
	7.7E-01	6.8E-01	6.1E-01	4.7E-01	3.6E-01	2.8E-01
	2.0E-01	1.9E-01	1.6E-01			
0829 2190	8.3E-01	2.0E-01	3.4E-02	8.1E-03	3.9E-03	1.1E-03
ASSP 3	2.1E+00	1.5E+00	1.4E+00	1.3E+00	1.5E+00	1.5E+00
	1.3E+00	1.1E+00	9.2E-01	6.1E-01	6.0E-01	4.6E-01
	3.6E-01	3.0E-01	2.2E-01			
0830 2250	5.9E-01	1.6E-01	2.5E-02	8.0E-03	1.7E-03	9.2E-04
ASSP 3	6.1E-01	4.7E-01	5.3E-01	8.4E-01	1.1E+00	1.0E+00
	9.1E-01	8.1E-01	7.9E-01	5.7E-01	4.3E-01	3.4E-01
	2.8E-01	2.6E-01	1.6E-01			
0831 2132	7.7E-01	1.4E-01	1.1E-02	2.6E-03	1.3E-03	1.3E-03
ASSP 3	5.3E-01	6.6E-01	4.9E-01	8.1E-01	7.8E-01	7.8E-01
	7.1E-01	6.8E-01	6.2E-01	4.0E-01	3.4E-01	3.0E-01
	2.6E-01	1.5E-01	1.6E-01			
0832 3704	8.8E-01	1.6E-01	1.2E-02	5.5E-03	9.3E-04	1.0E-03
ASSP 3	2.2E-02	6.8E-02	2.5E-01	3.9E-01	5.7E-01	5.5E-01
	5.4E-01	4.8E-01	4.3E-01	2.9E-01	2.4E-01	1.9E-01
	1.6E-01	9.7E-02	1.0E-01			
0833 4382	5.2E-01	1.3E-01	2.5E-03	3.9E-03	4.4E-04	9.6E-04
ASSP 3	6.1E-02	7.2E-02	3.8E-02	4.6E-02	5.5E-02	6.6E-02
	4.1E-02	5.2E-02	8.8E-02	5.8E-02	5.2E-02	3.3E-02
	2.1E-02	2.1E-02	3.0E-02			
0834 2977	5.8E-01	1.2E-01	6.1E-03	3.2E-03	2.6E-03	6.4E-04
ASSP 3	3.9E-02	1.4E-01	2.4E-01	3.2E-01	3.6E-01	3.6E-01
	3.3E-01	2.4E-01	2.6E-01	1.8E-01	1.4E-01	9.7E-02
	8.5E-02	5.5E-02	4.9E-02			
0835 2993	4.7E-01	1.6E-01	7.2E-03	3.8E-03	1.3E-03	1.3E-03
ASSP 3	3.2E-01	3.5E-01	3.5E-01	5.9E-01	6.2E-01	5.5E-01
	5.7E-01	4.2E-01	4.0E-01	3.6E-01	2.3E-01	1.5E-01
	1.6E-01	1.1E-01	7.6E-02			
0836 2037	7.2E-01	1.5E-01	1.3E-02	5.9E-03	2.4E-03	8.8E-04
ASSP 3	2.9E-01	4.8E-01	7.9E-01	1.2E+00	1.5E+00	1.1E+00
	1.0E+00	9.3E-01	7.1E-01	5.4E-01	4.2E-01	3.2E-01
	2.4E-01	2.0E-01	1.3E-01			
0837 2498	6.5E-01	1.5E-01	1.3E-02	3.2E-03	1.3E-03	3.2E-03
ASSP 3	1.1E+00	8.6E-01	5.1E-01	6.4E-01	6.7E-01	6.8E-01
	6.0E-01	5.6E-01	4.3E-01	3.4E-01	2.7E-01	2.3E-01
	1.7E-01	1.6E-01	1.1E-01			
0838 2471	7.3E-01	1.1E-01	1.5E-02	3.9E-03	2.2E-03	1.9E-03
ASSP 3	6.9E-01	5.2E-01	2.6E-01	3.0E-01	5.0E-01	4.4E-01
	4.5E-01	4.8E-01	3.8E-01	3.8E-01	3.1E-01	1.8E-01
	1.6E-01	1.3E-01	8.2E-02			
0839 2124	4.8E-01	6.9E-02	1.1E-02	4.5E-03	1.5E-03	1.1E-03
ASSP 3	3.7E-01	2.6E-01	3.4E-01	3.9E-01	5.7E-01	5.3E-01
	4.7E-01	3.9E-01	3.6E-01	3.1E-01	2.4E-01	2.1E-01
	1.4E-01	1.4E-01	5.8E-02			

0840 2355	6.8E-01	1.5E-01	1.9E-02	4.7E-03	4.5E-04	6.7E-04
ASSP 3	7.4E-01	3.7E-01	3.4E-01	3.9E-01	5.4E-01	6.3E-01
	5.4E-01	5.3E-01	5.7E-01	3.8E-01	2.9E-01	2.5E-01
	2.0E-01	1.1E-01	1.2E-01			
0841 1863	1.1E+00	1.7E-01	1.4E-02	7.5E-03	1.4E-03	1.7E-03
ASSP 3	2.0E+00	1.2E+00	6.5E-01	5.3E-01	8.3E-01	7.3E-01
	7.1E-01	6.2E-01	6.1E-01	4.7E-01	3.7E-01	2.4E-01
	2.7E-01	1.3E-01	1.4E-01			
0842 2790	9.4E-01	1.4E-01	1.7E-02	5.5E-03	1.4E-03	6.8E-04
ASSP 3	2.4E+00	1.3E+00	6.3E-01	5.7E-01	9.5E-01	8.8E-01
	7.3E-01	8.4E-01	5.8E-01	5.0E-01	4.2E-01	2.8E-01
	2.6E-01	1.8E-01	1.4E-01			
0843 1811	7.4E-01	1.7E-01	1.6E-02	3.8E-03	2.1E-03	1.6E-03
ASSP 3	4.2E+00	2.8E+00	1.2E+00	6.9E-01	8.2E-01	9.7E-01
	8.4E-01	7.6E-01	6.8E-01	5.3E-01	4.0E-01	3.2E-01
	2.0E-01	2.2E-01	1.3E-01			
0844 2041	4.8E-01	1.4E-01	9.1E-03	4.2E-03	1.1E-03	2.6E-04
ASSP 3	1.9E+00	1.3E+00	6.0E-01	4.0E-01	5.6E-01	4.7E-01
	5.0E-01	4.6E-01	3.9E-01	2.9E-01	2.9E-01	1.8E-01
	1.5E-01	1.2E-01	7.6E-02			
0845 2059	5.3E-01	1.5E-01	6.3E-03	2.8E-03	1.9E-03	1.1E-03
ASSP 3	1.2E+00	8.4E-01	1.2E+00	1.3E+00	1.9E+00	1.4E+00
	1.2E+00	1.1E+00	8.4E-01	5.4E-01	4.0E-01	3.1E-01
	2.2E-01	1.4E-01	9.7E-02			
0846 1930	6.6E-01	1.1E-01	1.4E-02	2.6E-03	1.3E-03	6.5E-04
ASSP 3	4.7E-01	7.7E-01	8.8E-01	1.0E+00	1.2E+00	1.0E+00
	8.7E-01	6.1E-01	5.1E-01	3.3E-01	2.9E-01	2.1E-01
	9.1E-02	1.0E-01	7.0E-02			
0847 2847	5.0E-01	1.1E-01	6.8E-03	5.3E-03	8.0E-04	5.9E-04
ASSP 3	1.2E+00	8.2E-01	4.4E-01	3.2E-01	4.1E-01	3.4E-01
	3.3E-01	2.6E-01	2.3E-01	1.8E-01	1.4E-01	9.1E-02
	5.5E-02	5.5E-02	5.2E-02			
0848 3790	5.5E-01	6.0E-02	5.2E-03	1.4E-03	1.4E-03	6.8E-04
ASSP 3	2.4E-01	2.2E-01	1.0E-01	8.7E-02	1.1E-01	1.4E-01
	1.0E-01	1.3E-01	8.5E-02	5.8E-02	4.0E-02	4.6E-02
	5.8E-02	1.5E-02	1.8E-02			
0849 3908	4.4E-01	9.0E-02	3.4E-03	2.4E-03	8.0E-04	2.9E-04
ASSP 3	3.1E-01	2.8E-01	6.7E-02	3.2E-02	6.4E-02	7.7E-02
	8.4E-02	7.0E-02	7.3E-02	4.0E-02	5.8E-02	3.6E-02
	3.3E-02	1.2E-02	1.8E-02			
0850 2904	7.7E-01	1.0E-01	7.9E-03	2.8E-03	1.9E-03	0.0E-01
ASSP 3	3.3E-01	3.0E-01	2.5E-01	2.1E-01	2.7E-01	2.3E-01
	1.9E-01	1.9E-01	1.4E-01	1.3E-01	8.5E-02	5.2E-02
	5.2E-02	5.8E-02	3.0E-02			
0851 2812	7.4E-01	1.3E-01	9.3E-03	4.2E-03	9.5E-04	1.0E-03
ASSP 3	1.0E+00	6.0E-01	3.3E-01	1.7E-01	2.2E-01	1.9E-01
	2.3E-01	2.2E-01	1.8E-01	1.5E-01	1.2E-01	1.0E-01
	6.7E-02	5.5E-02	4.9E-02			
0852 2977	5.3E-01	1.1E-01	1.3E-03	2.6E-03	1.8E-03	3.3E-04
ASSP 3	5.5E-01	9.5E-01	2.8E-01	2.0E-01	2.2E-01	2.2E-01
	2.0E-01	1.3E-01	1.5E-01	1.1E-01	1.1E-01	5.8E-02
	6.1E-02	4.3E-02	3.6E-02			
0853 3707	3.9E-01	8.7E-02	5.9E-03	1.2E-03	8.4E-04	3.1E-04
ASSP 3	4.1E-01	5.2E-01	1.2E-01	9.3E-02	6.1E-02	4.7E-02
	5.5E-02	5.5E-02	5.8E-02	3.6E-02	4.3E-02	2.7E-02
	2.7E-02	6.1E-03	2.1E-02			

Measurements of the Supersaturation Spectrum of Cloud Condensation Nuclei in the North Atlantic during the 1975 Fog Cruise of the USNS Hayes

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INTRODUCTION

When the relative humidity in the atmosphere exceeds 100%, water vapor condenses preferentially on certain aerosol particles, referred to as cloud condensation nuclei (CCN). Technically, CCN are those particles which, by virtue of their composition, size and other physical properties, have critical supersaturations less than the supersaturations existing in fogs and clouds. Stated another way, CCN are those select atmospheric particles which will serve as centers for fog and cloud droplet formation at the slight supersaturations attained in the atmosphere. Obviously, the concentration of CCN pre-existing in an air mass will exert a strong influence on the microphysical properties of fogs. Therefore, the supersaturation spectrum of CCN, i.e., the concentration of CCN as a function of supersaturation, is an essential input into numerical models of fog formation if accurate predictions of visibility and droplet size distribution are to be obtained.

During the 1975 Marine Fog Expedition, the supersaturation spectrum of CCN, in the range 0.17 to 0.80% supersaturation, was measured on a routine basis with NRL's thermal diffusion cloud nucleus counter.

THE NRL CCN COUNTER

There are two main components to the NRL Counter--a thermal gradient diffusion chamber in which an air sample is exposed to a supersaturated environment and an optical system for detecting the nuclei activated in this chamber.

Diffusion chamber--The diffusion chamber consists of two horizontal, nickel-plated brass plates separated by a cylindrical glass wall. The chamber so formed is 1.25 cm deep and 7.5 cm in diameter. To supersaturate the volume of the chamber, the plates are lined with filter paper wetted with distilled water and are maintained at different temperatures. The top plate is kept at room temperature while the bottom plate is cooled, by means of thermoelectric modules, to a predetermined temperature corresponding to a preselected level of supersaturation. The maximum supersaturation, which occurs midway between the plates, varies as the square of the temperature difference between the plates. Two copper-constantan thermocouples monitor the temperature of each plate. Thermocouple output is measured with a Keithley model 160B digital multimeter.

Optical System--A high intensity mercury arc lamp in conjunction with a suitable arrangement of lenses and slits produces an intense, narrow, rectangular beam, 0.3 cm high and 0.15 cm wide, across the center of the chamber. This beam illuminates droplets formed upon activated nuclei. A small region of this beam, having a volume of 0.0675 cm^3, is photographed at a 90° scattering angle with an 8 mm camera and is viewed simultaneously, also at 90°, by a video camera system. The concentration of CCN is determined by counting the number of droplets detected. No unactivated nuclei are detected photographically at supersaturations greater than about 0.15%. The video camera system includes a TV monitor and video recorder (Sony model AV 8650) and permits immediate playback and stop-frame counting of the droplets in the viewing volume so that an approximate (to within about 20%) CCN count can be obtained in near real time.

Provision for preheating the air sample--The NRL Counter is equipped to preheat an air sample to five different temperatures simultaneously. Air samples are preheated in order to obtain information on the possible chemical composition of CCN, according to a method described by Twomey (1971). In this method, the volatility of CCN is determined by heating a sample to various temperatures; in this way a curve (boiling-off curve) of the relative number of CCN surviving as a function of temperature is obtained. By comparing the boiling-off curve of natural CCN with the boiling-off curves of artificially-generated nuclei of known composition and similar in size to natural CCN, some information about the composition of the CCN can be derived.

In the NRL instrument, preheating is accomplished by passing the air sample through five parallel channels. Each channel contains a quartz tube, of 0.8 cm i.d. and 70 cm long, around which is wound a heating coil, the coils differing in wattage consumed. The wattages are selected to heat the sample to approximately 146, 212, 320, 480, and 615°C. After passing through the heating tube, the air sample passes into 3.5 liter holding chambers, one chamber for each tube, for temporary storage.

Sampling system--When a measurement was to be made, air was drawn through the main sampling tube, which was 36 m long and had a 2.5 cm i.d., at a rate of 0.28 m^3/min. This tube was of reinforced Tygon except for a 5.4 m stainless steel front section which protruded forward from the starboard bow a distance of 4.5 m. The inlet of the sampling tube was approximately 7.5 m above the sea surface. Wind tunnel tests showed that the airflow at the location of the inlet should be minimally affected by the presence of the ship. Air has a residence time in the tube of 3.3 sec. The diffusional loss of nuclei in the tube was computed to be less than 3%.

Commercially available heaters, protected with potted insulation, were wrapped around the outside of the stainless steel tube over much of its length. These heaters were used to heat the incoming air when the ambient relative humidity was very high, to prevent the air sample from

becoming supersaturated as a result of the cooling due to the pressure drop (2.5 mb) down the sampling tube. The heaters were designed to warm the air by as much as 0.5°C, which was enough to offset the cooling in the tube.

A second, 32-m long Tygon sampling tube, the inlet of which was located about 4.1 m off the starboard side of the ship at a point 22 m (one-third the length of the ship) from the end of the bow and at a height of 15 m above the sea surface, was available for use when winds were less favorable for sampling through the main tube. In general, no CCN measurements were made when the winds indicated that air was coming from the stern of the ship.

Air for analysis is bled off the sampling tube and stored in a 3.5 liter conditioning chamber to allow the sample to come to temperature equilibrium with the room. An aluminized mylar diaphragm lining the bottom of the conditioning chamber is then slightly pressurized to cause air to flow gently through the thermal diffusion chamber. After the chamber has been thoroughly flushed, it is closed off to permit the preselected value of supersaturation to be reached. The droplets formed upon active CCN are detected as described above. When the measurements at a given supersaturation are completed, the bottom plate is cooled to a new temperature. When the desired temperature differential between the plates has been established, the procedure is repeated by again flushing the cloud chamber with air from the conditioning chamber. If information on the volatility of CCN is to be obtained, the air sample is preheated as described above.

MEASUREMENTS

Measurements of CCN spectra obtained with NRL's CCN counter are presented in Table 1. Given are the photographically determined concentrations of CCN active at supersaturations of 0.17, 0.27, 0.40, and 0.80% at the indicated times. Measurements were made at intervals of 3 to 6 hours during the day except during fog events, when readings were taken more frequently. Ship location as a function of time is given elsewhere in this data report. In obtaining these spectra, a single determination of CCN concentration at each supersaturation was made. Brief comment on the accuracy of these concentration values is in order. It is known that, even for a macroscopically homogeneous sample, the number of particles in a small volume (0.0675 cm^3 in our case) will vary from one observation time to another, due to statistical fluctuations. To a reasonable degree of accuracy, it may be stated that the true CCN concentration (i.e. the CCN concentration which would be determined by observing a much larger volume of the sample or by averaging many observations of the number in our small volume) may differ from the concentration N (given in Table 1) determined from a single measurement of the number in our volume by as much as $\pm 3.85\sqrt{N}$. Thus the relative error is smaller at higher concentrations.

When fog was not occurring at the time of an observation, the concentration of CCN active at 0.80% supersaturation in a preheated sample was also measured. The last column in Table 1 lists the concentration of CCN which survived heating to 600°C in a manner similar to sea salt. In the case of the preheated samples, the CCN concentrations reported are an average of from two to four determinations. The standard error of the average value, $\overline{N}$, is roughly equal to $3.85\sqrt{\overline{N}}/\sqrt{n}$, where n is the number of determinations.

Measurements made after 1300 on 20 August were obtained while the ship was crossing the North Atlantic, enroute to Glasgow, Scotland.

REFERENCES

Twomey, S., 1971: The composition of cloud nuclei. J. Atmos. Sci., 28, 377-381.

TABLE 1

Number of CCN per cm^3 as a Function of Supersaturation

DATE (1975)	TIME (EDT)	SUPERSATURATION (%) 0.17	0.27	0.40	0.80	0.80 (Heated Sample)
30 July	0715	1480	1584	2472	5017	217
	1100	1243	2634	3360	4307	
	1415	1835	2768	3064	3493	187
	2300	2042	3182	3788	4173	207
31 July	0645	2146	3286	4070	4381	217
	0915	1021	1820	2412	3478	281
	1330	2398	3611	4810	5195	340
	1855	2013	5047	5461	6201	377
1 Aug	1015	355	1051	1998	3004	0
	1330	311	518	770	1356	0
	1900	695	1421	1806	1954	22
2 Aug	0700	414	474	607	696	22
	1000	474	562	755	992	5
	1620	429	592	977	1347	25
	1925*	814	1347	1746		
	1955*	592	1702	2753	3892	
	2025*	577	1391	2975	3818	
	2212	503	592	622	1110	35
	2255*	340	680	932	1169	
	2312*	459	548	784	1243	
3 Aug	1005	622	666	932	1687	64
	1345	266	474	503	829	45
	1545	296	518	622	918	
	1615*	237	252	281	296	
	1655*	237	266	281	355	
	1855*	192	311	355	888	
	1940*	192	252	651	1820	
4 Aug	0640	104	118	118	207	15
	0720*	118	133	148	266	
	1850	89	89	118	133	0
5 Aug	0545*	252	340	503	533	
	0605*	296	340	503	562	
	0630*	326	326	533	577	
	0755	414	636	866	977	69
	1025*	296	548	592	740	
	1605	696	1228	1806	2546	40

TABLE 1 (continued)

Number of CCN per cm^3 as a Function of Supersaturation

DATE (1975)	TIME (EDT)	SUPERSATURATION (%) 0.17	0.27	0.40	0.80	0.80 (Heated Sample)
6 Aug	0550*	237	385	385	518	
	0610*	340	385	474	666	
	0655*	326	592	844	1154	
	0750	311	385	740	947	89
	0900*	326	518	799	873	
	1305	858	1465	1939	2368	8
	1615	296	681	725	858	54
	1900	666	1302	1510	1998	15
7 Aug	0500*	488	784	962	1302	
	0600*	488	725	918	1154	
	0700*	163	829		1214	
	0915	400	592	947	977	37
	1315	370	474	740	1006	15
	1630	207	326	385	414	37
	1810*	207	237	340	355	
	1840*	266	281	385	400	
	1910*	266	340	385	607	
	1935*	296	311	355	533	
	2150	429	592	740	903	37
8 Aug	0630*	548	562	962	1036	
	0730	355	799	1051	1242	15
	0850*	296	370	459	696	
	0920*	207	237	237	311	
	1105	59	163	192	237	8
	1410	148	192	222	547	0
	1600	178	473	740	1021	0
	1810	340	829	858	1480	
9 Aug	0730*	59	118	222	237	0
	0750*	385	459	1243	2087	
	0800*	252	607	888	1643	
	0805	148	429	592	1347	
	0811	89	192	488	1539	
	1345	118	237	311	474	0
	1525	104	118	281	311	0
	1715*	74	133	237	414	
	1720*	59	148	148	222	
	1725*	104	118	163	281	

TABLE 1 (continued)

Number of CCN per cm^3 as a Function of Supersaturation

DATE (1975)	TIME (EDT)	SUPERSATURATION (%) 0.17	0.27	0.40	0.80	0.80 (Heated Sample)
9 Aug (cont.)	1730*	118	148	178	326	
	1738*	148	163	222	311	
	1743*	163	207	252	266	
	1746*	163	192	326	340	
	1800*	148	192	237	400	
	1815	163	192	370	444	
	2145	222	281	296	385	0
10 Aug	0900	192	237	252	311	0
	1210	222	355	370	547	0
	1750*	192	281	296	326	
	1755*	178	222	355	444	
	1800*	192	311	341	444	
	1805*	163	266	311	341	
	1810	252	311	311	341	
	1940	207	355	518	710	0
	2235*	207	474	488	607	
	2247*	281	311	533	562	
	2253*	281	311	414	488	
	2257*	207	355	429	548	
	2305*	222	237	385	400	
	2310*	222	326	414	562	
	2330*	281	296	488	503	
	2345*	222	296	459	503	
11 Aug	0800*	710	873	3078	4943	
	0810*	577	1258	2176	2324	
	0815*	696	1406	1450	2664	
	0825*	400	710	1095	2220	
	0840*	503	1140	1184	1806	
	0855*	755	1095	1272	2087	
	0915	696	1510	1658	1806	
	1210	1051	2457	2842	4647	
	1800	1672	2457	3966	4366	0
16 Aug	1435	178	355	947	1998	7
17 Aug	0810	207	533	799	1332	
	1245	237	340	903	1524	0
	1745	1066	1184	1347	2620	81

TABLE 1 (continued)

Number of CCN per cm^3 as a Function of Supersaturation

DATE (1975)	TIME (EDT)	SUPERSATURATION (%) 0.17	0.27	0.40	0.80	0.80 (Heated Sample)
18 Aug	0845	104	207	370	636	22
	1745	237	252	310	370	15
19 Aug	0600	237	237	326	340	22
	1120	725	873	1006	1184	
	1700	829	1791	2427	6112	59
20 Aug	1300	474	932	1302	1347	45
	1830	770	1495	2338	2427	49
21 Aug	0740	902	1613	1435	3108	81
	1200	666	1154	1421	2057	74
	1730	444	518	829	1539	89
22 Aug	0800	429	459	562	1125	45
	1200	237	444	814	1406	52
	1645	311	651	799	1021	30
	2040	340	622	740	1169	37
23 Aug	0905	296	518	725	888	37
	1245	326	474	577	681	30
24 Aug	0810	385	548	577	740	74
	1300	104	163	281	311	37
	1630	104	133	163	163	96
	2010	104	178	207	207	30
25 Aug	0730	44	44	74	133	15
	1150	30	44	118	148	0
	1700	59	74	74	222	0
	1945	118	148	148	266	7
26 Aug	0650	15	74	104	237	4
	1100	30	44	59	192	7
	1440	163	281	296	385	15
	1900	163	281	296	592	0
27 Aug	0500	237	444	459	592	22

*Indicates measurements made in fog.

Measurements of CCN Concentrations in Fogs*

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During a fog episode some airborn nuclei (CCN) grow to produce fog droplets because the supersaturation in the fog is higher than the critical supersaturation of these "activated" nuclei. The other nuclei in the air remain "unactivated" and of small size. This report briefly describes some CCN measurements we made on the ship during fog episodes. The purpose was to estimate the supersaturation in the fogs.

Two aerosol containers, each of 28 liters maximum volume, were simultaneously filled on the second deck of the ship during fog episodes. The containers were then brought below deck and the concentrations of nuclei active at 0.1% supersaturation were measured with a vertical flow thermal diffusion chamber. The difference between the two containers was that the first, call it "container I", was equipped with an impactor, such that all particles larger than 0.5μm diameter were removed before the foggy air passed into the container. In contrast, for the second container, call it "container D", the foggy air went directly into the container through a 0.9cm diameter tube, 10cm long, at a flow ratio of $500cm^3/sec$.

The above proceedure was designed so that only unactivated nuclei are taken into container I, while both activated and unactivated nuclei are brought into container D. This assumes that most of the fog drops below 20μm diameter go into container D and evaporate, so that these activated nuclei are retained. It also assumes that transient supersaturation experienced while nuclei pass through the impactor do not cause spurious nuclei activation and impaction. Both of these assumptions are supported by calculations too lengthy to include here.

The above measurements were made during two fogs, that of August 3, between 1800 and 1810 local time, when the visibility was about 2400 meters (NRL instrument), and on August 4, between 1420 and 1430, when the visibility was 550 meters. For the first fog container D gave 213 nuclei cm^{-3}, and container I gave 186 cm^{-3}. For the second fog container D gave 126 cm^{-3}, and container I gave 90 cm^{-3}. Thus, the impactor did not remove a significant protion of the nuclei, and so most of them were unactivated during the fog.

The most likely conclusion from the measurements is that the supersaturation in the fogs was less than 0.1%. There is also a possibility of a strong continuous source of fresh nuclei, for example from the water surface, such that the nuclei did not have

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time to grow although the fog supersaturation was above their critical value.

The above experimental data is very sparse, because the CCN counter was not in satisfactory condition. I regard the conclusions as tentative and would like to repeat the experiments on another cruise.

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Field Measurements with a Cloud Condensation Nucleus Spectrometer in Marine Fogs

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ABSTRACT

During the last one-year period, a field version of our Cloud Condensation Nucleus (CCN) Spectrometer capable of continuously monitoring and displaying in real-time the activation spectrum of fog and cloud nuclei was fabricated and field-tested. The tests proved it to be a dependable field instrument. In July, 1975, the CCN Spectrometer was installed aboard U. S. Naval Ship Hayes for measuring the characteristics of aerosols that participate in the marine fog formation. The spectrum measurements were made during a three-week-long cruise aboard the ship off the coasts of Nova Scotia and Newfoundland. Some two thousand spectra were measured while approaching the fog, in the fog, and getting out of the fog. A variety of fog conditions were encountered in the field. A comparison of the CCN spectrometer data was also made with the data obtained by the NRL (Naval Research Laboratory) chamber. The agreement between our spectrometer and the NRL chamber was found to be the same as the agreement between the latter and other static thermal diffusion chambers compared so far.

Our field measurements demonstrate that the fog nuclei spectrum in the supersaturation range of 0.15-1.2% undergoes a marked change at the fog boundaries. This is exemplified by a case study of the fog that occurred in the early morning hours (2:00 A.M. - 8:00 A.M.) of 6 August 1975, off the Nova Scotia coast. The fog nuclei concentration within the dissipating fog boundary was found to be much lower than that at the forming boundary. The fog appeared to be an efficient scavenger of nuclei active at 1.2 % supersaturation and below. The slope of the spectrum, which is one of the important parameters in modeling microphysical interactions, also registered a profound change at the forming boundary. The fog nuclei concentrations at the forming boundary were typical of continental aerosols that evidently participated in the marine fog formation. It is pointed out that for evolving a precise model for predicting fog visibilities, microphysical interactions will have to be considered along with kinetic and thermodynamic interactions. Our measurements constitute one of the parameters of consequential importance in delineating microphysical interactions.

1. INTRODUCTION

The physical processes which interact to produce fogs are varied and complex. For example, the marine advection fog forms when a shallow layer of moist air, trapped beneath an inversion, moves from a region

of warm ocean surface temperature to a region of colder surface temperature. The downward transport of thermal energy in the moist layer leads to formation of a region of supersaturation near the ocean surface and formation of fog. Subsequently, the fog may be intensified by further heat losses due to radiative cooling.

The essential physical processes in a macroscopic sense are the fluxes of heat and moisture across the air-sea interface and the rates of vertical transport of heat and moisture by eddy and molecular diffusion processes. The presence of a low-lying inversion is crucial because it acts as a barrier to upward vapor transport, thus allowing the boundary layer to accumulate moisture until the saturation level is reached. Radiative cooling will tend to accentuate the inversion once the fog has formed.

A number of numerical models have been developed to describe marine fog formation in terms of these macroscopic processes (Fisher and Caplan, 1963; Mack et al, 1972; Barker, 1973). We shall denote such models as "thermodynamic" models, since they assume a state of thermodynamic equilibruim between liquid water and water vapor wherever the total concentration of water substance exceeds the liquid saturation level. In other words, a supersaturated condition is never permitted to exist. Such models are useful for investigating the conditions under which fog may form. However, they provide no information on the properties of the fog, other than an estimate of its liquid water content.

The most important aspect of fog as it affects naval activities is the reduction of visibility it produces. Visibility in fog depends entirely upon the number concentration and size distribution of the hydrometeors comprising it. Thermodynamic models cannot describe these properties; they can only be determined by considering the kinetics of hydrometeor formation, growth, and evaporation. A model which couples the thermodynamic description with the rates of microphysical processes is required if we wish to investigate the fog droplet size distribution in space and time. We shall refer to such models as "kinetic" models. A kinetic model provides the information required to predict fog visibilities, and also permits a quantitative investigation of fog modification possibilities. Such a model is highly desirable, and does not exist for marine fog at this time. We (Fukuta, 1973, 1974) have already analyzed physical interactions in the simplified air slab model, with a constant eddy diffusivity. As a result of this analysis, it was clearly demonstrated that the measurement of fog nuclei spectrum, particularly at the upwind fog boundary, constitute an essential input parameter for predicting fog visibitities.

2. ACCOMPLISHMENTS

Before proceeding to analyze the spectrometer data, it is in order to comment on what and how the measurements are made. The principle of the spectrometer was discussed by Fukuta and Saxena (1973a), the details of a preliminary working design were described by Fukuta et al (1974), and

Saxena and Fukuta (1974), and a field version of the spectrometer was presented by Fukuta and Saxena (1975). Recently, the merits of the spectrometer were also stressed by Veal et al (1975). From these discussions, it is clear that the spectrometer produces an activation spectrum of fog or cloud nuclei in a desired supersaturation range ($S_{min} \geq 0.15\%$) at as short a time interval as 15 seconds. The resulting activation spectrum is displayed by an X-Y recorder. For counting the activated nuclei, each droplet bigger than the threshold size is counted individually as soon as it passes through the sensitive volume of the Climet CI-201 Particle Analyzer and instantaneous droplet counts are registered. The rate at which the droplets pass through the detection volume determines the droplet concentration. For example, a smaller time interval between two droplets passing successively through the sensitive volume would correspond to a higher concentration.

Case Studies of Fog Episodes--The measurements taken during the Marine Fog Field Expedition of August, 1975, offer a unique opportunity to comprehensively study some fog episodes that were extensively monitored by various participants. Modeling of microphysics-dynamics interactions demand these measurements for a reasonable prediction of fog visibilities. After the CCN data are duly compiled, some case studies for modeling purposes will be undertaken. The physical model of marine advection fog presented by Fukuta (1973) emphasizes the importance of interaction between fog nuclei and the environmental change for arriving at realistic estimates of fog visibilities. Those fog episodes will be chosen for case studies that present dramatic variations in the fog nuclei spectrum while approaching the fog and getting out of fog. The main aim of putting the Fukuta-Saxena CCN Spectrometer aboard the Hayes was to monitor such variations. The spectrometer undoubtedly affords the best time resolution for such studies.

Let us consider Fog #4 that occurred during the early morning hours (2:00 A.M. - 8:00 A.M.) of 6 August 1975, off the Nova Scotia coast as shown in Figure 1. The spectrum was monitored during the ship track, A-B-C-D-E. At point D (i.e. at 1:50 A.M.), the true wind direction was 340°. Thus, point D may be regarded as lying at the forming boundary of the fog. At point E, the wind direction was 13°, and it may be considered at the dissipating boundary of the fog. During the episode, the winds were mild to calm, the true wind speed varying from 0.4 knots (at 3:40 A.M.) to 14.7 knots (at 2:20 A.M.).

In Fig. 2, the visibility (β) is plotted as a function of time. The plot is based on the data provided by the NRL. To obtain the true value of visibility, the values of Fig. 2 should be divided by 1.65 within the fog (Jeck, 1975). The latter is the calibration factor. However, for our discussion, the relative values of visibility will suffice. The fog nuclei spectrum recorded at different times during the episode was reduced to the form CS^k. In Table 1, the values of C and K are listed at different times. For these k-values, the nuclei concentrations in the supersaturation range of 0.15% to 1.2% were

considered. In this supersaturation range, all droplets that grew beyond 1.0 μm diameter were counted. The spectrometer, however, sustained a supersaturation range of 0.06% to 1.2% and the droplets grown beyond 0.3 μm and 0.5 μm were also recorded. The latter data will be analyzed in the future in order to estimate fog nuclei concentrations active at supersaturations below 0.15%. The nuclei concentrations at 0.15% (N_1) and 1.2% (N_2) supersaturations are also recorded as a function of time in Table 1. The data of Table 1 are shown plotted in Fig. 2.

From Fig. 2, the dramatic variations in k, N_1, and N_2 at the fog forming boundary are noteworthy. Just before 2:00 A.M. peaks in visibility (β), k, N_1, and N_2 superimpose on each other. At the fog forming boundary, the nuclei concentration at 0.15% supersaturation drops by a factor of 1.35, while at 1.2% it drops by a factor of 6.0. The latter indicates a pronounced change that is beyond any kind of experimental error. The mechanism for this dramatic reduction in N_2 may be scavenging. These observations stress the need for monitoring the entire nuclei spectrum at the fog boundaries. Within the fog, the changes in N_1, N_2, and k are not as dramatic but at the fog dissipating boundary, all these parameters show an upward trend and correlate well with the visibility. At the fog forming boundary, the absolute nuclei concentrations (for example, 2500 cm^{-3} at S = 1.2%) suggest that the aerosol that participated in the fog formation was continental in character. Such analysis is required for each fog episode in order to make the input data ready for a fog model that is capable of predicting fog visibilities. The final model will have to account for the scavenging effects of fog also. More case studies will shortly be made and a kinetic fog model to utilize these data is presently being developed. The kinetics of the fog formation (Fukuta & Saxena, 1973b) and nucleation-growth interactions (Fukuta & Walter, 1970; Nix & Fukuta, 1973) will be fully accounted for in such a model.

Ice Nucleation Properties and Chemical Nature of Marine Nuclei-- One of the most interesting aspects of our participation in the Marine Fog Field Expedition was the exploration of the potential of our spectrometer for studying the ice nucleation properties and chemical nature of the marine fog nuclei. The valuable cooperation of Dr. R. C. Schnell of National Oceanic and Atmospheric Administration, Boulder, Colorado, and of Dr. R. E. Baier of Calspan Corporation, Buffalo, New York, resulted in such studies. For the purpose of these studies, the optical counter (Climet 201 sensor) was disconnected from the main chamber and the fog droplets that formed on the nuclei at the minimum and maximum test supersaturations were collected through a condenser arrangement in a test tube. The amount of fog water collected depends upon the time duration of collection, the CCN concentration in the sample, and the temperature difference between the median plane of the chamber and the surface of the collector. For our operating conditions, about half an hour was sufficient for collecting the sample for infrared spectrum analysis by Baier (1972), but for Schnell's drop freezing technique, a larger sample volume was required and consequently a lower time resolution could be achieved. A summary of these results

is being worked out and will be made available shortly. It is interesting to note that some fog nuclei also behaved as freezing nuclei but this did not occur for all the samples. A careful analysis of these results is evidently warranted.

The infrared spectrum analysis of the samples was carried out by Baier using a Perkin-Elmer Model 700 Spectrometer which has also been used for extensive identification of the dominant chemical composition of sea-surface films, natural slicks, and foams (Baier et al, 1974). This indeed is a very useful technique and can be conveniently used in conjunction with our continuous flow spectrometer. Fig. 3 displays two infrared spectra produced by Baier's technique. It is obvious that an absorption peak (corresponding to a dip in the transmittance) appears around the frequency of ~ 1700 cm^{-1}. It is indicative of an organic ester-like material that was demonstrated by Baier to be water soluble. The peak is pronounced in curve B in comparison to curve A. This leads to tentative conclusion that more such material nucleates as higher supersaturations are encountered. Samples A and B were taken in the fog-free marine air. At present, it is hard to speculate the origin of this material. However, separate tests showed that it does not represent any impurity either in the collecting device or in the main chamber and is a characteristic of the incoming sample. Further work on these samples is in progress. Dr. Baier's work has already established that our spectrometer can be usefully employed for deriving information regarding the chemical nature of fog nuclei through the infrared spectrum analysis.

3. CONCLUSIONS AND RECOMMENDATIONS

The Marine Fog Field Expedition sponsored by the Naval Air Systems Command and organized by the Naval Research Laboratory during July-August, 1975, was one of the most successful experimental programs motivated to understand the complex fog phenomena. Our participation resulted in extensive measurements of the activation spectrum of fog nuclei. The following conclusions seem to be reasonable on the basis of our study.

1. For the prediction of fog visibility, it is imperative to estimate the concentration and size distribution of droplets that comprise the fog. Such an estimation demands the knowledge of the activation spectrum of fog nuclei.

2. Our case study shows a profound change in the fog nuclei spectrum at the fog forming boundary, the change was less dramatic at the dissipating boundary. Nevertheless, a definite change in the activation spectrum was observed at both fog boundaries. From a theoretical standpoint, such a change was anticipated on the basis of a kinetic fog model (Fukuta & Saxena, 1973b; Fukuta, 1973, 1974).

3. The fog was demonstrated to be an efficient scavenger of cloud condensation nuclei active at 1.2% supersaturation and below. A complete fog model should include the operative scavenging mechanisms also.

4. In some fog episodes, the nuclei concentrations were typical of a continental aerosol that evidently participated in the marine fog formation.

5. A comparison of our spectrometer data with that obtained by the Naval Research Laboratory static chamber showed that the agreement between the two was the same as the agreement between the NRL chamber and other static thermal diffusion chambers compared so far. This is a very gratifying result, particularly when one recalls the preference between the counting techniques employed in the two devices. Our spectrometer records instantaneous concentration while the NRL chamber produces "average" values.

6. Some tests on the fog water collected from our spectrometer showed that the fog-free marine air contained some CCN that may also be potential freezing nuclei. These tests were conducted in cooperation with Dr. R. C. Schnell.

7. The infrared spectrum of the fog water collected from our spectrometer indicated that the CCN in the fog-free marine air contained organic ester-like material that was shown to be water soluble. These experiments were done in cooperation with Dr. R. E. Baier and further studies on the subject are in progress.

It is highly recommended that the data collected during the expedition should be fully analyzed in terms of a fog model that accounts for the microphysics-dynamics interactions. The prediction of fog visibilities heavily depends upon the availability of such a model. The data collected during the expedition afford a unique opportunity of verifying the predictions of the model since simultaneous visiometer observations are available for various fog episodes. The analysis of the available data in terms of a comprehensive fog model will also help plan future field expeditions efficiently.

Acknowledgments: The authors gladly acknowledge the valuable cooperation of Mr. Stuart Gathman during the field program. Keen interest of Dr. R. E. Baier and Dr. R. C. Schnell in our spectrometer resulted in some new information. Drs. Mack and Katz assisted one of us (V.K.S.) in taking the spectrum observations upwind of the fog episodes.

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Table 1

Values of constant (C), slope (k), and nuclei concentrations at 0.15% (N_1) and 1.2% (N_2) supersaturations for Fog #4

Date	Time hr, EDT	C cm^{-3}	k	N_1 cm^{-3}	N_2 cm^{-3}
8/5/75	21.54	2,250	1.36	150	3,350
8/5/75	22:57	530	0.60	170	610
8/6/75	1:09	260	0.45	105	280
8/6/75	1:30	315	0.36	148	330
8/6/75	1:46	2,300	1.13	250	2,500
8/6/75	2:00	330	0.34	185	415
8/6/75	2:17	480	0.80	125	550
8/6/75	3:07	320	0.54	120	350
8/6/75	4:26	370	0.62	125	490
8/6/75	7:06	240	0.94	42	435
8/6/75	7:45	150	0.91	35	185
8/6/75	7:55	145	0.59	51	170
8/6/75	8:02	260	0.89	82	320

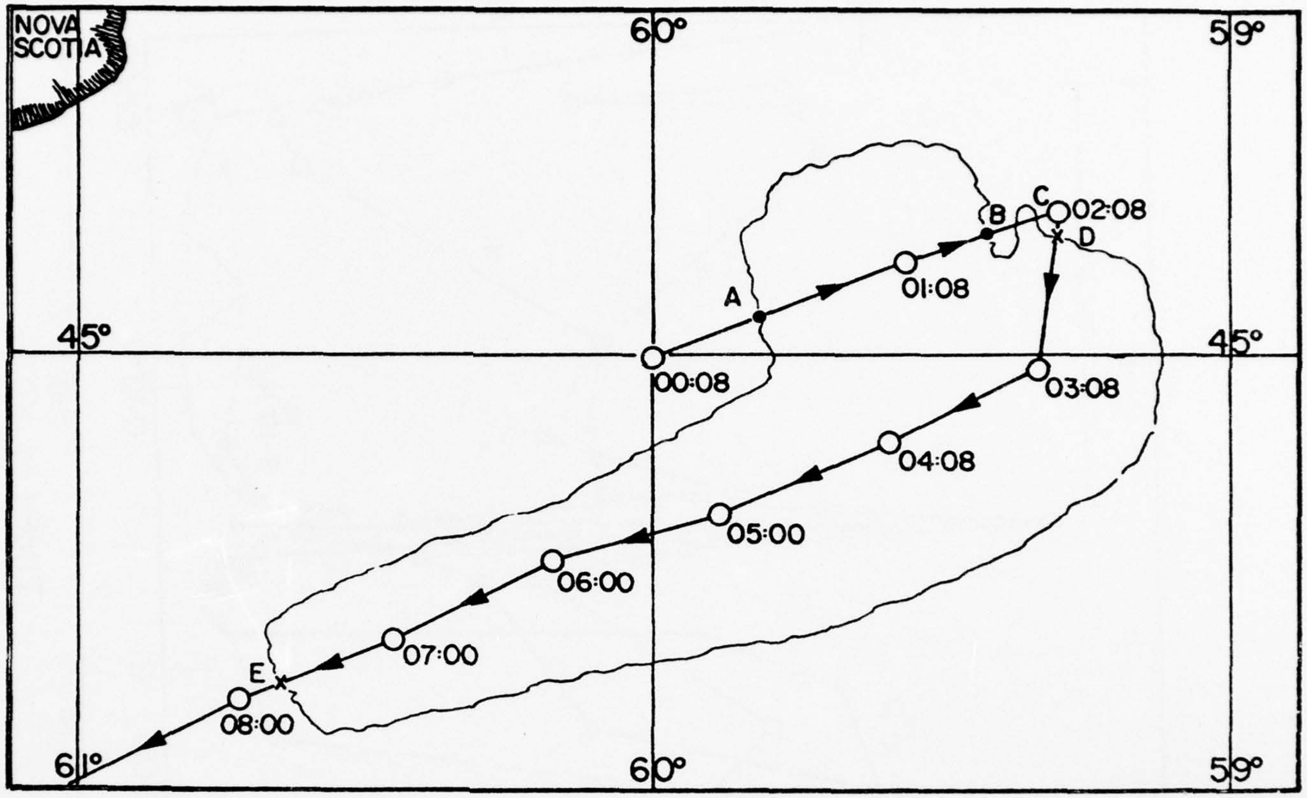

Fig. 1. Track of USNS HAYES in fog episode #4 that occurred during the early morning hours (2:00-8:00 A.M.) of August 6, 1975.

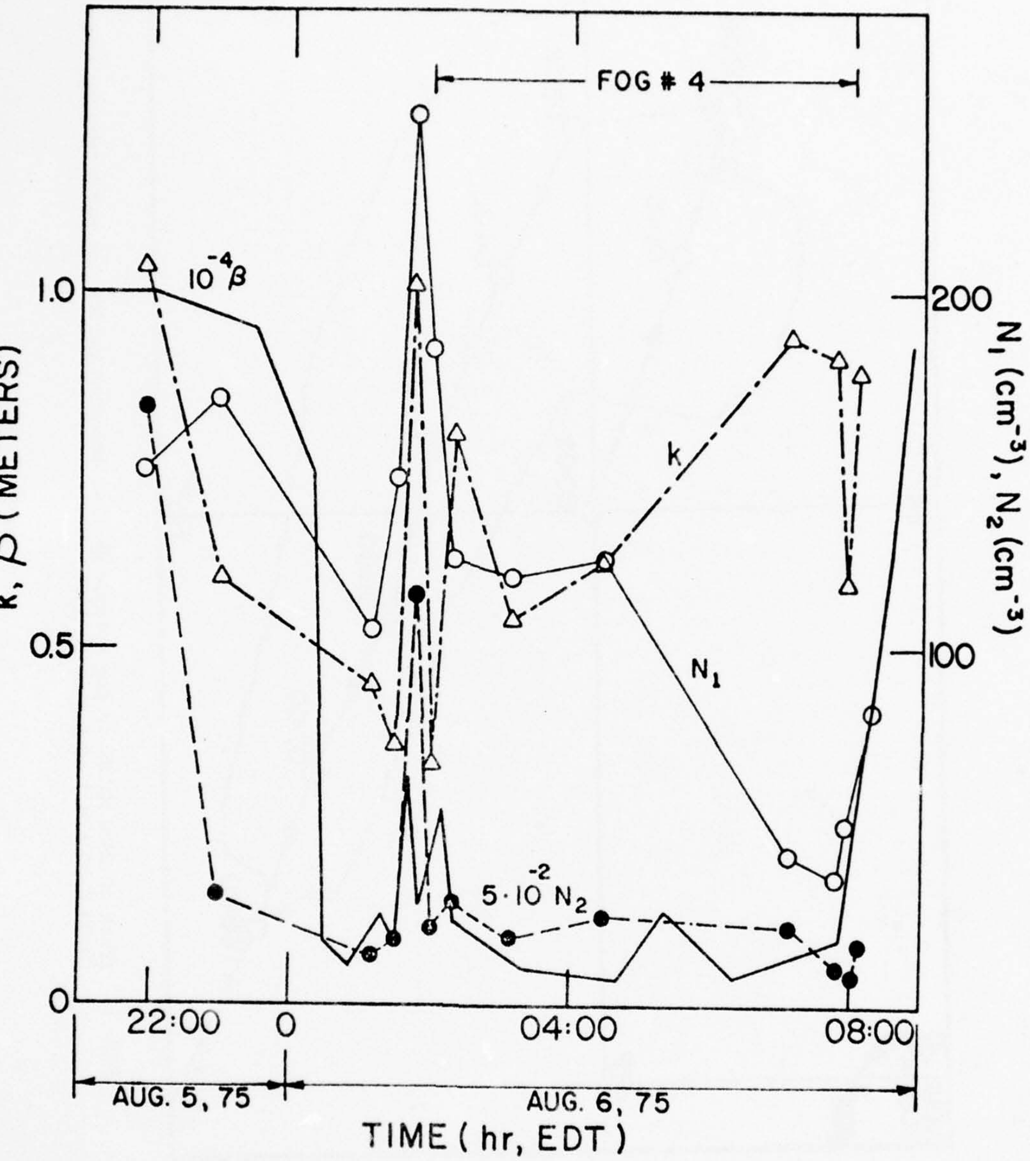

Fig. 2. Plot of visibility (β), nuclei concentrations at 0.15% (N_1) and 1.2% (N_2) supersaturations, and the slope (k) of the nuclei spectrum as a function of time for Fog #4. β is represented by a continuous thick line, k by dash-dot line, N_1 and N_2 by thin continuous line and broken line, respectively.

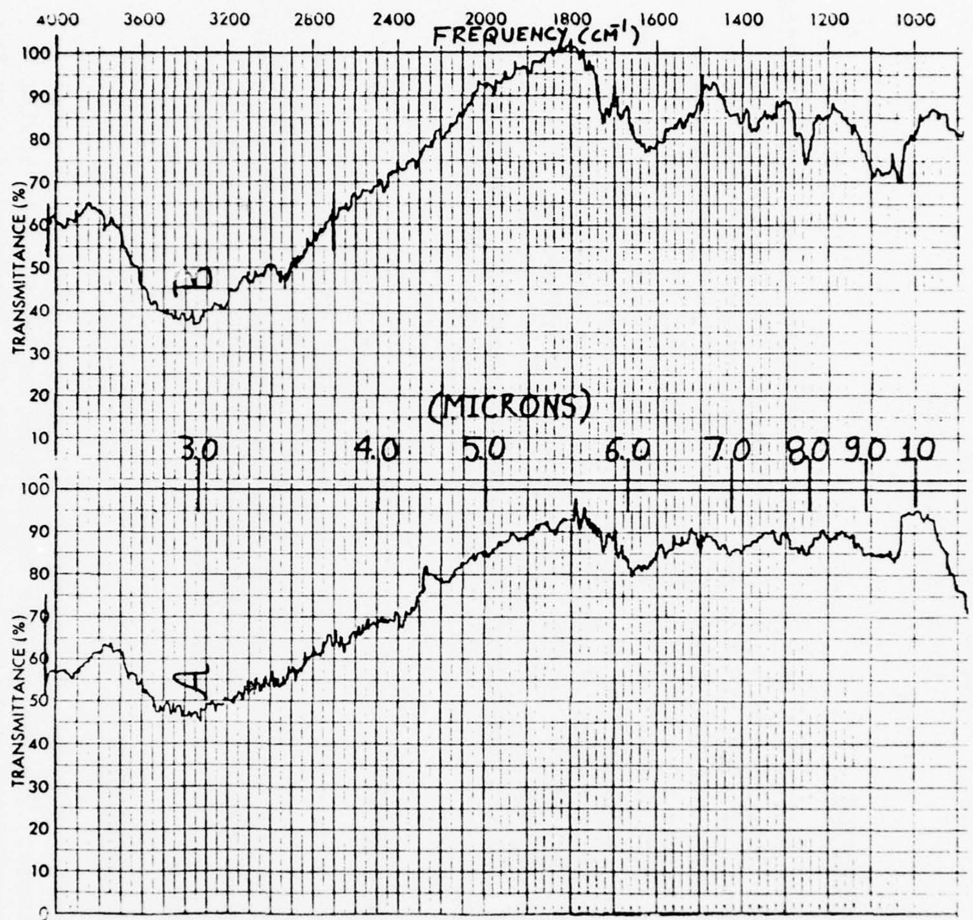

Fig. 3. Infrared spectra of fog water collected from the CCN Spectrometer: A - Supersaturation of ~0.15%, water collected at 10:45 EDT on August 10, 1975; B - Supersaturation of ~1.2%, water collected at 13:17 EDT on Agusut 9, 1975. The air samples entering into the spectrometer were taken off the Newfoundland coast.

Preliminary Data Analysis of
Turbulence Wind & Temperature Measurements

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I. INTRODUCTION

This report provides a partial presentation of the August, 1975, Marine Fog Cruise Data reduced at NAFI (J. Russell). The data consists of measurements of wind, temperature, and relative humidity made aboard the USNS Hayes off the coast of Nova Scotia. Direct measurements of the mean values of wind speed ($\bar{U}$), wind direction ($\bar{\theta}$), and relative humidity (%R.H.) were made at two levels and temperature ($\bar{T}$) at three levels, one being at the sea surface. Direct measurements of the turbulent fluctuations of wind speed (u') and air temperature (T') were also made at two levels. Reduced data presented here consists primarily of values of the rate of dissipation of turbulent kinetic energy ε and the temperature structure parameter C_T^2. Measurements of microwave refractive index were also made at two levels but are not reported on here.

II. CRUISE TRACK

The track of the NRL cruise is shown in Fig. 1. The track presented here is the same as that presented in Calspan Corporation's contribution to this volume, modified to include subsequent changes suggested by Calspan. The original track in the Calspan contribution to this volume was a modified track of one produced by G. Schacher of Naval Post Graduate School (NPGS).

III. INSTRUMENTATION

$\bar{T}$ was monitored every few seconds at all three levels using quartz thermometers. The sea surface temperature was measured by towing a quartz thermometer probe in the water along the starboard side at the stern. $\bar{U}$ was taken in one minute averages using cup anemometers and electronic counters. %R.H. was monitored at the same interval as $\bar{T}$ and was obtained using instrumentation described in G. Schacher's paper in this volume. $\bar{\theta}$ was measured using fast response styrofoam vanes.

Measurements of u' were made using Thermo-Systems Incorporated (TSI) Model 1054B constant temperature hot wire anemometers using 4.5 micron diameter tungsten wires. T' measurements were made using 2.5 micron diameter platinum wires in a constant current AC bridge. u' was obtained

by AC coupling and filtering the signals from their respective sensors. The unconditioned signals from the TSI anemometers were recorded on a strip chart recorder in an attempt to provide in-situ calibration. Differentiators were used to obtain time derivatives of u' ($\partial u'/\partial t$) and T' ($\partial T'/\partial t$) at both levels.

The instruments at the lower level were mounted on a small tower located on the port bow at approximately 12.2 meters (40 feet) above the sea surface. The instruments at the upper level were located on the lower radar platform on the main mast at a height of approximately 24.7 meters (81 feet) above the sea surface. Because of the up-slope of the air flow over the ship, the air being sampled at each of the two levels actually originates from some lower level. With data taken by NRL in a wind tunnel using a model of the Hayes (see Fig. 2), the true measurement heights are estimated to be approximately 11.3 meters (37 feet) and 18.6 meters (61 feet) for the lower and upper levels respectively. This represents a height difference of 7.3 meters (24 feet) between the two levels. The actual heights presented here may be somewhat in error because of the inadequacies in the wind tunnel data.

IV. INTERFACE ELECTRONICS

Interface electronics were fabricated at NAFI to allow the NRL on-board computer to be used to log certain data. The data that were successfully logged on the computer were mean wind speed from the NPGS cups and hot wires, wind direction from the NAFI vanes, mean refractive index and air temperature from the microwave refractometer and associated thermistor, and a limited amount of data from the NPGS quartz thermometers and LiCl humidity sensors. Wind direction was sampled once a second and averaged for one minute. The mean wind speed from the cups versus the output from the hot wires was used in an attempt to provide in-situ calibration constants for the hot wires. The computer was used to calculate relative humidity from the NAFI refractometer and associated thermistor data and the pressure data from the ship's barometer. These data were printed out every minute, but calibration factors, then not available, need to be applied to obtain good %R.H. data.

Interface electronics were also designed to allow the calculation of real time spectra of wind, temperature, and refractive index. However, because of technical problems in high frequency coupling with the computer, no real time high frequency spectra were obtained. A few spectra with an analysis range of approximately 50 Hz using the lower sampling rate program described elsewhere in this report, are shown in Figures 3 and 4 to illustrate the kind of product that can be obtained in real time. Figures 5 and 6 show the power spectrum of the ship's vertical acceleration and angular (roll) motion. These spectra were generated by the NRL accelerometer and rate gyro, respectively. They are shown here to qualitatively indicate the difficulty in making direct measurements of momentum and heat flux using the eddy correlation technique in which turbulent fluctuations in vertical velocity must be measured in a

frequency range of 0.01 to 1 Hz. Note the large amount of energy in the frequency range, 0.06Hz to 0.2 Hz, a region in which one expects to find a large percentage of the turbulent motion involved in producing vertical fluxes of momentum and heat.

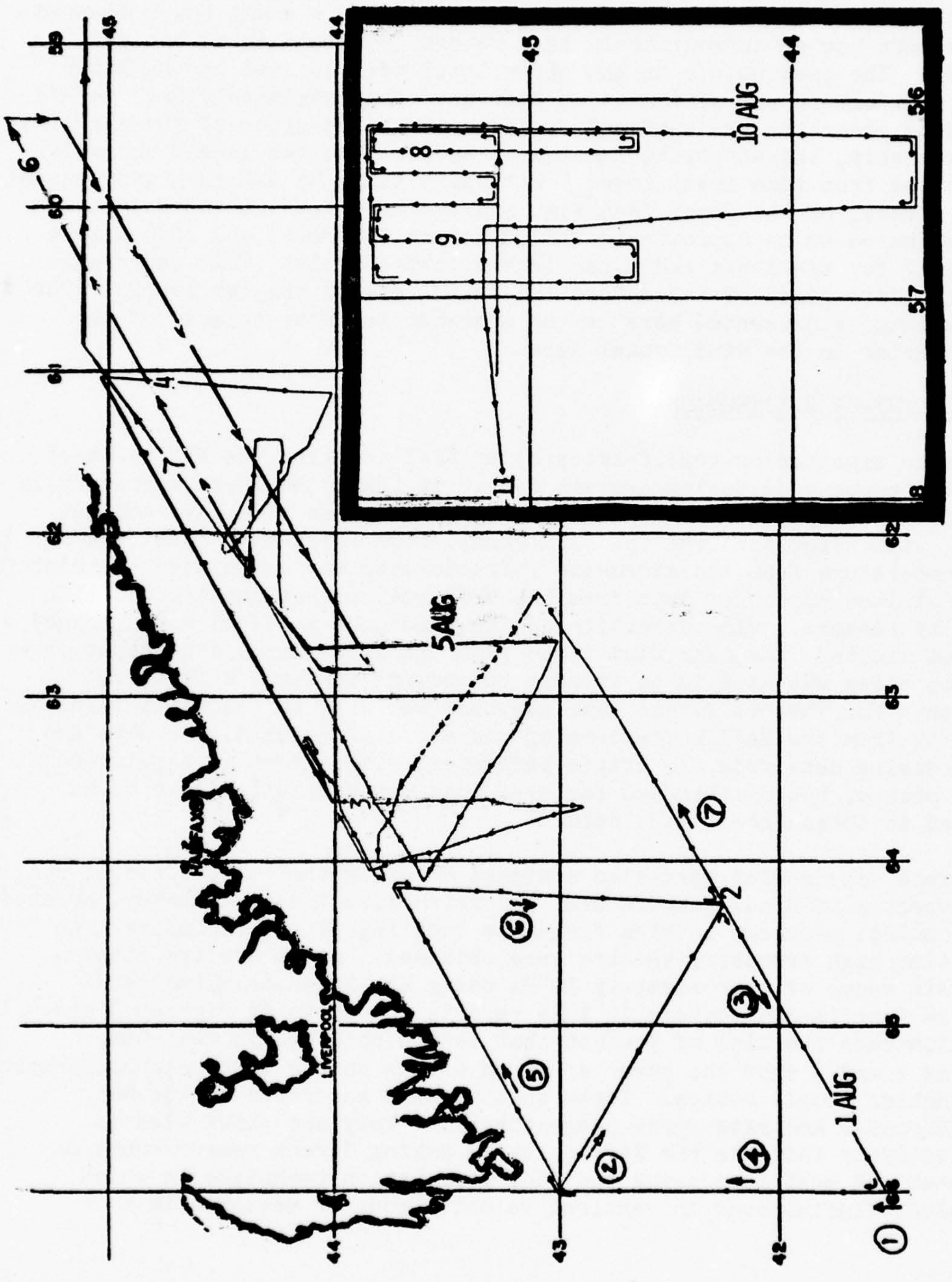

Figure 1. Plot of Track of the U.S.N.S. Hayes During the NRL Marine Fog Cruise in August 1975

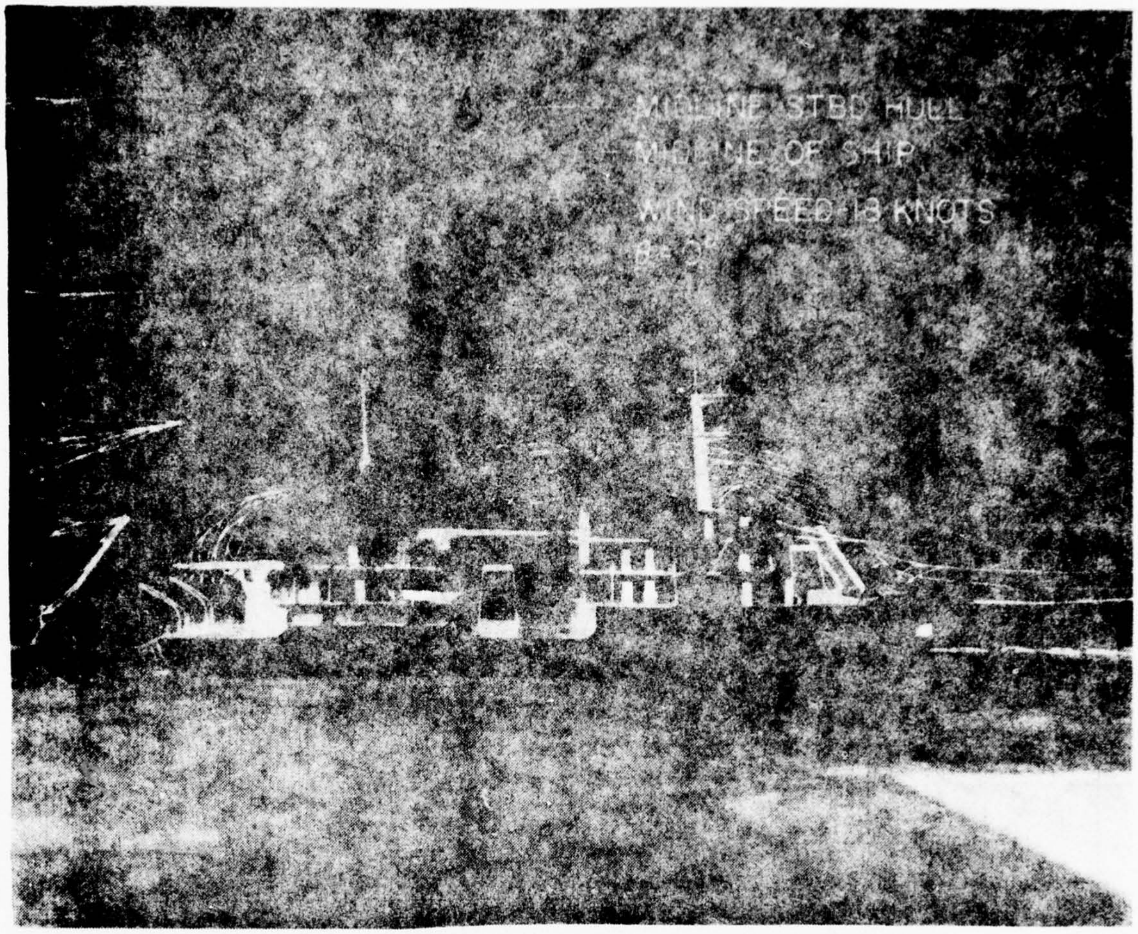

Figure 2. Wind Flow Around the U.S.N.S. Hayes
As Determined in Wind Tunnel

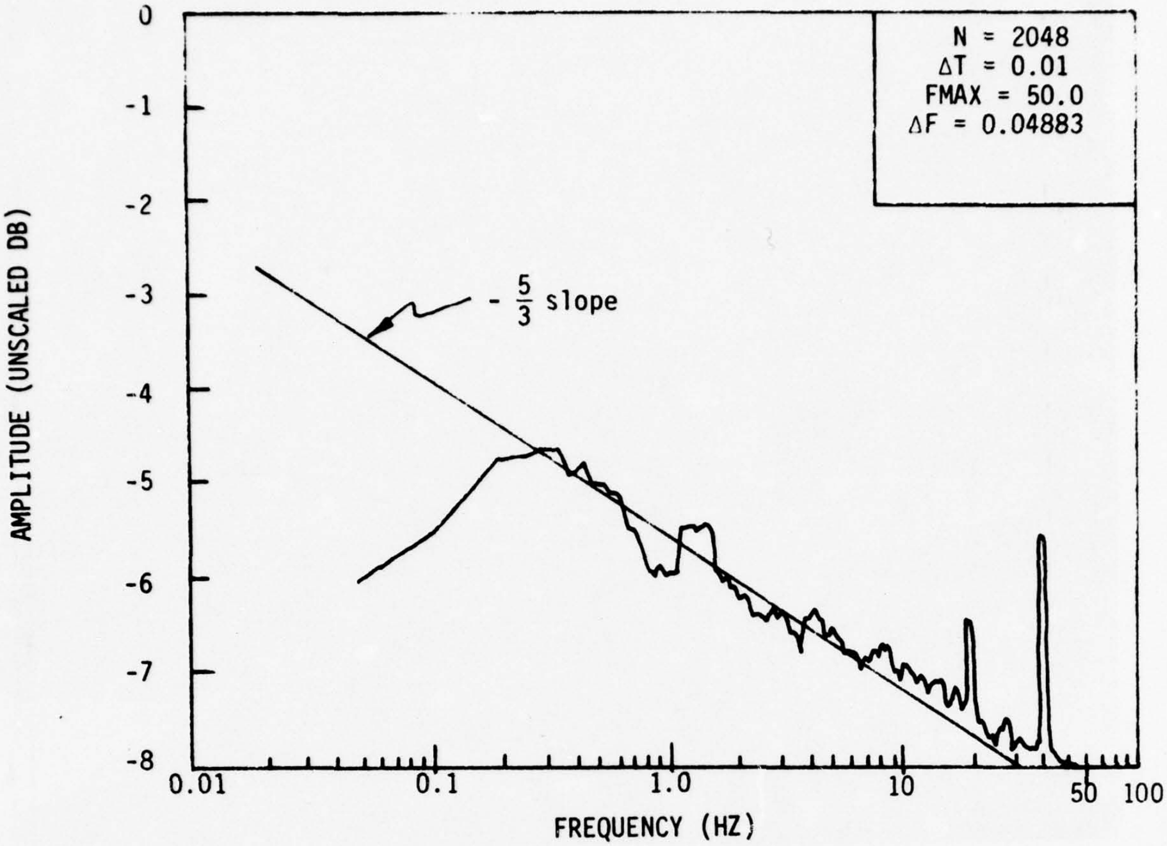

Figure 3. Power Spectrum of u'

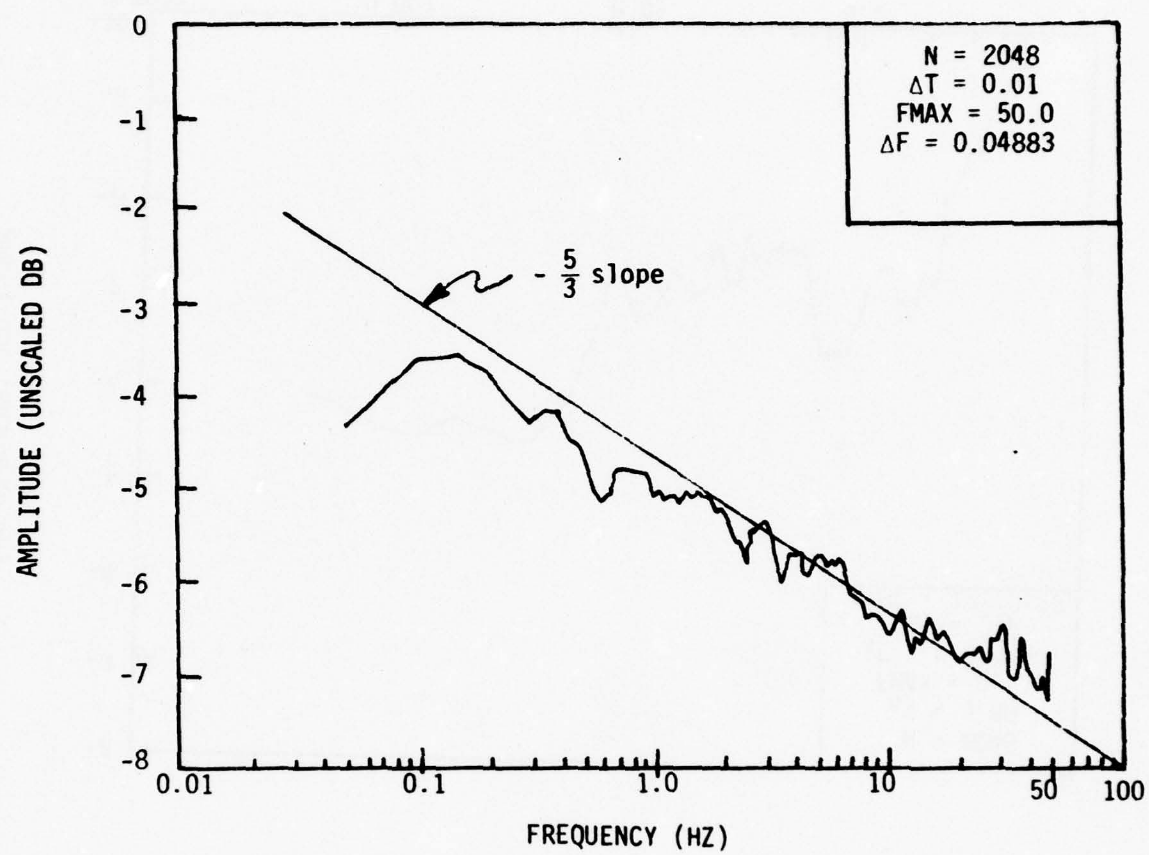

Figure 4. Power Spectrum of T'

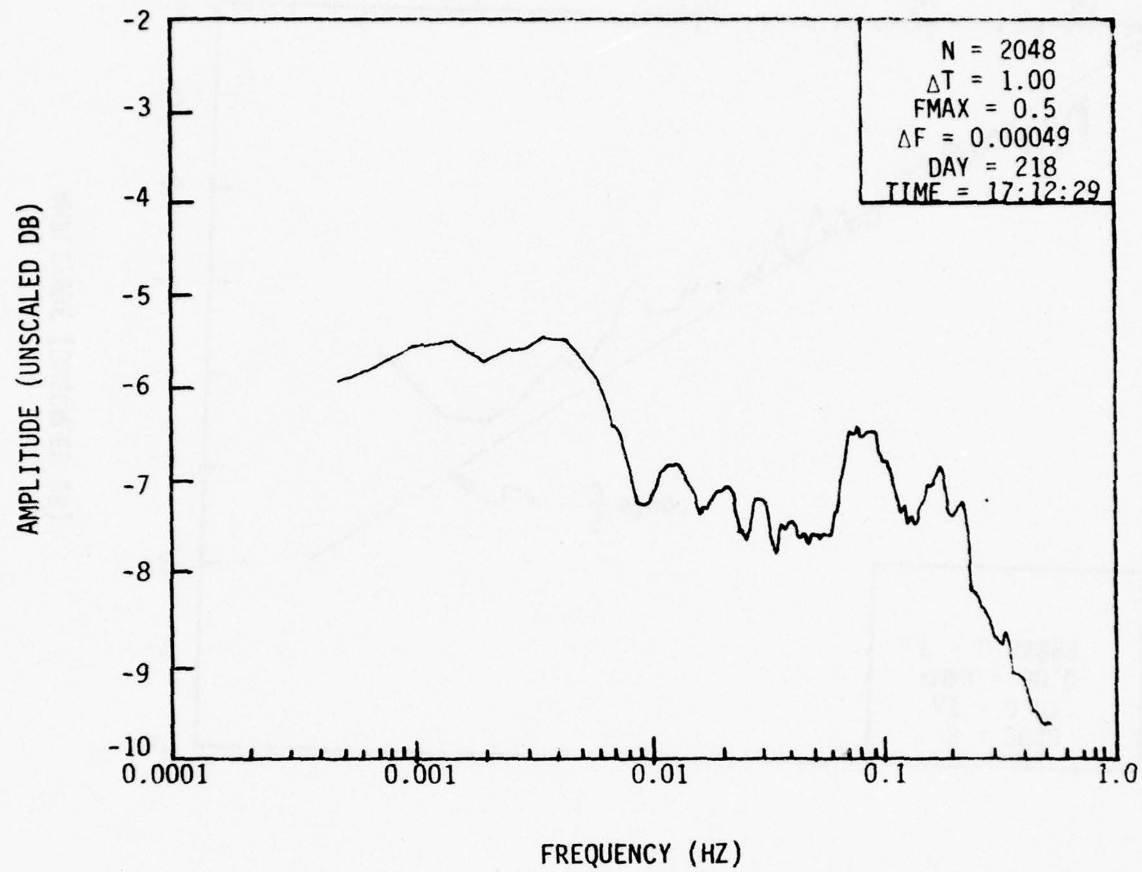

Figure 5. Power Spectrum of Z Axis Acceleration

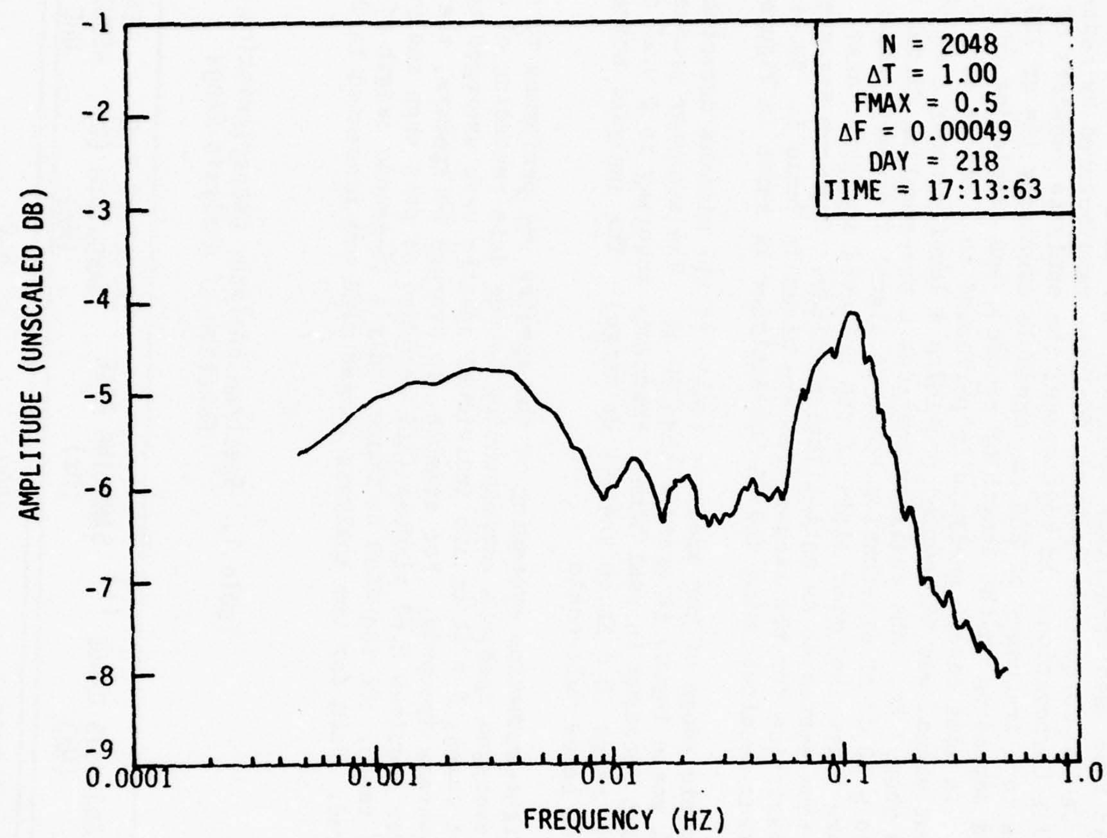

Figure 6. Power Spectrum of Vertical Rate Gyro

V. SPECTRAL ANALYSIS

The primary results presented in this report involve a preliminary analysis of some of the turbulent wind speed (u') data and turbulent temperature (T') data. More than 1500 recorded time histories of u', T', N', $\partial u'/\partial t$, and $\partial T'/\partial t$ have been spectrally analyzed. The analysis was performed using a Model UA-500 Ubiquitous Spectrum Analyzer manufactured by Federal Scientific Corporation. In most cases, the analysis consists of analyzing the data to a frequency of 200 Hz, ensemble averaging (64 or 128 spectra averaged depending on the length of record), and displaying in a log-log format. In some cases, analysis is performed to 1 kHz or even 2 kHz. The input signal was AC coupled providing a low-frequency 3 dB cut-off at less than 3 Hz. The analyzer contains a pre-sampling filter which provides $\geq$ 50 dB of attenuation to input signal frequency components which are twice the upper limit of the selected analysis range. This filter thus serves as an anti-aliasing filter. Spectrum analyzer characteristics for the ranges used are given in Table 1. An example of a spectrum obtained using the UA-500 Analyzer is shown in Figure 7.

The dynamic range of the analyzer (ratio of the minimum detectable signal to full scale input) is greater than 50 dB. The analyzer produces a 500-point spectrum in real time. Frequency accuracy is ± 0.2% of the full analysis range (0.8 Hz on the 200 Hz range). The analyzer noise level is $\geq$ -55 dB below full-scale.

A straight-summation averaging of the spectra was performed to obtain a final averaged spectrum corresponding to one data recording of one variable. In most cases, N = 64 or 128 individual spectra were averaged to produce this average spectrum. For example, to average 64 spectra, the analyzer/averager requires 2.67 minutes (160 seconds) of data when analyzed on the 200 Hz range. On the 2000 Hz range, only a 16-second length of record is required. Data for the analysis ranges used are presented in Table 2.

Table 1. Spectrum Analyzer Characteristics As a Function of Analysis Range

ANALYSIS RANGE (1) (Hz)	SAMPLING RATE (Hz)	EFFECTIVE 3 dB BANDWIDTH (2) (Hz)	LENGTH OF SIGNAL REQUIRED TO PRODUCE ONE SPECTRUM (SEC)
0-2000	6000	6.0	0.25
0-1000	3000	3.0	0.50
0-200	600	0.6	2.50

(1) Starts at 0 for DC coupled input but will be several Hz for AC coupling.

(2) This bandwidth is indicative of the analyzer's ability to resolve two equal-amplitude sine waves.

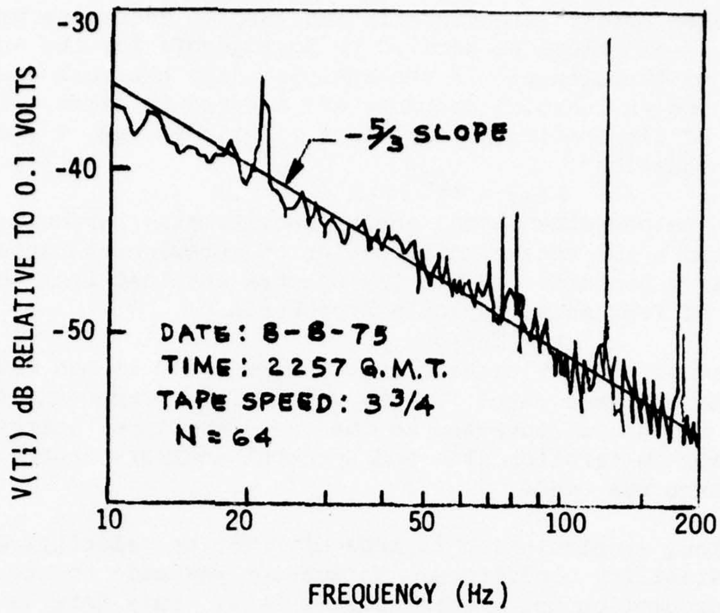

Figure 7. Average Spectrum for the Voltage Associated With T'_1

Table 2. Analyzer/Averager Record Length Requirements

NUMBER OF SPECTRA AVERAGED (N)	200 Hz RANGE		1000 Hz RANGE		2000 Hz RANGE	
	SEC	MIN	SEC	MIN	SEC	MIN
16	40	-	8	-	4	-
32	80	-	16	-	8	-
64	160	2.67	32	-	16	-
128	320	5.34	64	-	32	-
256	640	10.6	128	2.13	64	-
512	1280	21.3	256	4.26	128	2.3
1024	2560	42.6	512	8.52	256	4.26

VI. RATE OF DISSIPATION OF TURBULENT KINETIC ENERGY CALCULATIONS

The averaged spectra are visually analyzed to determine whether they followed a -5/3 slope as derived by Kolmogoroff for the so-called inertial subrange of turbulence. If the analyzed data has such a slope, local isotropy and an inertial subrange are assumed to exist. In such cases, the rate of dissipation of turbulent kinetic energy, ε , can be determined from the equation

$$\phi(k) = \alpha\varepsilon^{2/3} \quad k^{-5/3} \tag{1}$$

relating the one-dimensional energy density $\phi(k)$ per unit mass to the wave number k and rate of dissipation of turbulent kinetic energy ε, where α is a constant. Since the spectra obtained from the UA-500 are in terms of frequency, Taylor's hypothesis

$$k = 2\pi f/\overline{U} \tag{2}$$

is invoked to convert to wave number k, where $\overline{U}$ is the mean relative wind. The ordinate value for any value of f corresponds to the spectrum level of u' and is converted to the one-dimensional energy density $\phi(k)$ by applying calibration data and spectral analysis theory. The value of α used here was 0.48.

In addition, a calculation is made of friction velocity, u_*, assuming neutral stability conditions. No attempt was made to check the validity of this assumption using mean profile data. This data is presented only to provide a rough idea of the values of the momentum flux which can be calculated as ρu_*^2, where ρ is the atmospheric density.

No attempt to weed out bad data has been made here. All data for which adequate measurements of $\overline{U}$ exist and for which there was at least a section of the spectrum which followed a -5/3 slope were considered. The results of the calculations at levels 1 and 2 are presented in Tables 3 through 14.

The tables are organized according to date of measurement as referenced to Greenwich Mean Time (GMT). Subscripts 1 and 2 refer to the bow level and mast level, respectively. $\overline{U}$ values are the mean wind values relative to the ship and should not be taken as true wind.

Table 3. ε and u_* Values for 31 July 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
2030	4.03	71.29	31.80	3.89	91.41	40.81
2230	9.63	25.31	22.52	10.57	26.12	26.88

Table 4. ε and u_* Values for 1 August 1976

TIME GMT	$\bar{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\bar{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0039	8.38	11.31	17.21	8.92	11.32	20.34
0230	4.83	10.31	16.69	5.11	40.23	31.04
0340	3.81	24.26	22.20	3.91	23.08	25.79
0430	3.51	4.05	12.23	3.78	4.00	14.38
0558	9.18	12.20	17.65	11.02	4.81	15.30
0704	8.81	5.90	13.86	10.43	3.25	13.42
0830	7.14	3.52	11.67	8.12	3.71	14.03
0936	5.96	-	-	6.45	0.14	4.67
0912	7.58	0.66	6.67	9.23	2.07	11.55
1602	7.54	0.33	5.29	8.67	0.062	3.59
1821	5.30	0.49	6.07	5.89	1.43	10.20
2038	9.61	2.25	10.05	11.16	-	-
2245	8.52	2.04	9.72	9.80	2.18	11.75

Table 5. ε and u_* Values for 2 August 1976

TIME GMT	$\bar{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\bar{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0005	3.38	2.79	10.80	4.15	2.15	11.70
1341	5.56	0.36	5.47	6.41	1.08	9.30
1722	4.17	6.52	14.33	5.53	15.22	22.45
2200	4.26	3.07	11.14	6.19	0.56	7.49
2327	7.56	9.71	16.36	8.48	11.63	20.53
2346	5.84	7.86	15.25	6.43	4.63	15.10
2353	5.30	1.29	8.35	5.91	0.39	6.59
2359	6.08	0.36	5.47	6.99	4.96	15.45

Table 6. ε and u_* Values for 3 August 1976

TIME GMT	$\bar{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\bar{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0005	5.98	45.05	27.29	6.90	77.76	38.67
0012	6.12	16.29	19.44	6.99	55.67	34.59
0023	5.04	4.94	13.06	5.21	0.25	5.68
0059	5.91	-	-	6.41	0.039	3.07
0203	5.35	2.25	10.04	6.19	1.19	9.61
0220	4.55	1.97	9.62	7.09	0.24	5.61
0239	5.53	3.26	11.37	7.16	0.48	7.08
0247	5.58	1.65	9.05	6.81	0.029	2.78
0251	5.56	2.32	10.14	7.04	0.059	3.53
0300	4.33	0.34	5.34	7.58	0.089	4.04
0309	6.71	5.39	13.44	8.01	-	-
0322	8.76	4.77	12.90	10.9	-	-
0345	8.83	3.40	11.52	10.2	1.07	9.29
0400	8.35			9.68	0.22	5.45
0603	4.19	10.42	16.75	4.92	-	-
0617	-	-	-	4.95	0.70	8.06
0712	4.26	2.65	10.61	4.99	0.71	8.08
1209	7.14	2.84	10.86	7.91	2.45	12.22
1457	9.18	3.51	11.66	10.81	1.71	10.84
1521	9.18	3.51	11.66	10.38	1.66	10.72
1547	9.84	3.73	11.88	11.18	2.49	12.28
1640	9.89	3.74	11.90	11.11	2.48	12.26
1840	10.93	5.76	13.74	12.31	3.82	14.16
1927	10.15	3.83	11.99	11.42	2.54	12.35
1936	10.81	4.04	12.21	12.27	3.20	13.36
1947	10.95	5.77	13.75	12.38	2.72	12.64
1955	11.09	5.83	13.80	12.50	2.74	12.67
2046	10.93	8.13	15.42	12.31	6.41	16.83
2054	12.17	8.94	15.91	10.57	6.70	17.08
2109	11.54	7.18	14.79	13.42	8.20	18.27
2140	11.99	7.42	14.96	13.33	5.77	16.25
2218	13.12	9.55	16.27	-	-	-
2330	11.51	8.51	15.66	13.19	5.72	16.20

Table 17. Values of $\phi_T(20)$ and C_T^2 for 2 August 1976

Table 7. ϵ and u_* Values for 4 August 1976

TIME GMT	$\bar{U}_1$ (M/SEC)	ϵ_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\bar{U}_2$ (M/SEC)	ϵ_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0000	11.56	6.05	13.97	13.19	4.05	14.44
0030	12.24	6.36	14.21	12.75	4.99	15.48
0100	12.83	9.36	16.16	14.62	6.25	16.69
0205	11.37	5.96	13.91	12.64	3.91	14.27
0230	3.89	1.47	8.72	6.45	4.48	14.94
0303	4.88	107.75	36.49	6.22	65.24	36.47
0400	4.52	36.03	25.33	7.07	102.00	42.33
0459	5.13	66.88	31.13	-	-	-
0534	5.51	59.58	29.95	-	-	-
0954	7.30	74.94	32.33	-	-	-
1056	8.95	210.83	45.64	-	-	-
1108	8.97	117.79	43.12	-	-	-
1123	8.03	192.42	44.27	-	-	-
1155	8.85	175.81	42.96	-	-	-
1204	9.00	178.18	43.15	-	-	-
1220	9.82	57.33	29.57	-	-	-
1234	9.70	134.55	32.29	-	-	-
1252	8.62	60.97	30.18	-	-	-
1316	8.38	50.11	28.27	-	-	-
1344	9.51	93.66	34.83	-	-	-
1519	6.50	271.10	49.63	-	-	-
1604	8.92	177.00	43.05	-	-	-

Table 8. ε and u_* Values for 5 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
1429	5.02	1.60	8.96	-	-	-
1522	3.81	14.49	18.69	4.66	22.01	25.39
1558	3.28	25.83	22.67	3.41	34.70	29.55
2008	4.19	15.59	19.16	3.98	13.92	21.79
2120	3.43	26.72	22.92	4.17	28.82	27.78
2227	3.90	17.57	19.93	4.38	3.77	14.11

Table 9. ε and u_* Values for 6 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0005	4.00	4.49	12.65	4.19	2.58	12.43
0100	3.89	-	-	4.55	6.53	16.93
0204	5.51	0.43	5.80	6.17	1.77	10.97
0323	9.35	14.88	18.86	10.22	0.34	6.35
0433	7.28	7.20	14.81	8.97	6.88	17.23
0450	7.89	6.47	14.29	9.75	10.45	19.81
0510	8.34	22.70	21.71	10.31	15.51	22.59
0530	9.47	21.24	21.24	10.13	15.26	22.47
0550	10.34	38.41	25.87	11.35	10.06	19.56
0610	3.33	73.64	32.14	3.81	37.89	30.43
0630	3.00	28.76	23.49	4.12	12.04	20.77
0645	2.83	23.14	21.85	4.03	16.70	23.16
0704	7.32	20.40	20.95	7.70	2.14	11.67
0730	6.26	30.18	23.87	6.59	7.46	17.71
0835	8.48	-	-	9.02	8.21	18.28
0925	7.28	-	-	7.82	3.64	13.93
1024	8.03	-	-	8.67	1.41	10.16
1106	6.81	16.17	19.39	7.14	11.27	20.31
1137	6.52	-	-	6.88	-	-
1220	6.19	2.67	10.63	6.66	1.34	9.99
1315	8.08	-	-	8.67	1.68	10.76
1412	6.76	8.06	15.37	7.21	-	-
1420	6.78	4.05	12.22	7.23	2.86	12.86
1432	6.17	3.75	11.92	6.64	3.76	14.09
1600	6.76	2.02	9.70	7.72	2.14	11.68
2025	4.03	-	-	4.15	2.56	12.39
2141	5.25	13.15	18.10	5.37	8.89	18.77
2253	5.56	4.10	12.28	5.82	4.76	15.24
2310	5.39	-	-	5.37	1.12	9.41
2325	4.22	-	-	4.31	0.12	4.44

Table 10. ε and u_* Values for 7 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0045	6.36	2.72	10.71	6.52	0.78	8.35
0200	4.76	0.097	3.52	4.97	5.91	16.38
0738	2.88	-	-	4.17	48.38	33.01
0900	4.71	5.32	13.39	4.92	4.39	14.83
0926	4.05	4.72	12.87	4.12	3.80	14.14
0945	4.21	2.44	10.33	4.48	4.06	14.45
1000	3.26	3.98	12.16	3.61	2.42	12.17
1018	3.26	3.35	11.48	3.58	3.40	13.63
1037	2.83	3.58	11.73	3.38	4.59	15.06
1055	2.88	3.63	11.79	3.26	4.46	14.91
1123	4.40	-	-	4.69	1.06	9.23
1150	5.28	2.92	10.96	5.68	1.75	10.92
1235	4.19	-	-	4.38	1.42	10.17
1339	6.10	6.56	14.35	6.05	3.68	13.99
1408	5.72	10.45	16.77	5.70	6.99	17.32
1503	4.17	-	-	5.82	16.85	23.23
1807	3.41	9.79	16.40	4.05	14.92	22.31
1949	3.33	-	-	4.69	11.88	20.67
2128	3.18	-	-	4.76	7.16	17.46
2137	3.13	-	-	3.86	10.17	19.63
2148a	3.41	-	-	4.33	11.15	20.24
2148b	3.41	-	-	4.05	10.56	19.88
2202a	4.08	-	-	4.88	10.31	19.72
2202b	4.08	-	-	4.19	5.44	15.94
2230	3.18	-	-	3.46	4.67	15.15
2240	3.08	-	-	3.68	5.84	16.31
2300	7.04	10.43	16.76	8.05	3.32	13.51
2326	5.84	6.33	14.19	7.63	2.24	11.86
2347	6.36	9.59	16.29	7.61	0.40	6.66

Table 11. ε and u_* Values for 8 August 1976

TIME GMT	$\bar{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\bar{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0024	3.98	11.05	17.08	4.68	9.99	19.52
0157	5.82	6.31	14.17	6.24	7.53	17.76
0214	5.93	4.54	12.70	6.40	1.93	11.29
0238	6.29	1.42	8.62	7.16	1.06	9.25
0300	3.33	4.06	12.23	3.51	3.35	13.55
0320	3.30	2.02	9.70	3.41	2.31	11.99
0340	3.28	6.73	14.48	3.38	4.59	15.06
0356	2.80	7.10	14.73	4.57	8.24	18.30
0409	2.90	7.29	14.87	3.98	10.42	19.79
0430	3.38	2.06	9.75	3.48	1.98	11.38
0457	3.58	2.15	9.90	3.98	1.85	11.13
0505	3.53	4.25	12.42	3.56	2.40	12.12
0526	3.96	1.96	9.59	4.07	1.89	11.20
0542	4.38	2.12	9.85	4.40	0.50	7.21
0700	3.48	4.20	12.37	3.66	2.91	12.93
0754	5.08	2.84	10.85	5.30	2.33	12.02
0821	4.83	2.72	10.70	5.02	1.33	9.96
0845	3.73	0.56	6.31	3.81	0.75	8.25
0900	4.15	-	-	4.71	2.12	11.64
0915	2.83	-	-	3.36	3.23	13.40
1028	6.22	0.84	7.23	6.87	-	-
1053	5.44	0.27	4.94	6.12	0.33	6.27
1130	6.90	2.58	10.51	7.70	1.60	10.60
1140	7.53	4.66	12.80	8.34	-	-

Table 11. ε and u_* Values for 8 August 1976 (cont'd)

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
1200	9.02	21.59	21.35	9.84	-	-
1210	9.18	18.45	20.26	10.00	8.00	18.12
1230	8.74	12.52	17.80	9.37	0.48	7.08
1303	9.98	23.57	21.99	10.88	20.24	24.76
1330	10.10	20.04	20.83	10.71	16.95	23.27
1407	9.98	9.94	16.49	10.31	4.12	14.52
1452	8.95	9.04	15.98	9.30	4.47	14.92
1552	8.34	4.27	12.44	8.83	1.80	11.02
1640	7.81	4.04	12.21	8.29	5.71	16.20
1755	3.61	4.32	12.48	4.02	3.14	13.27
1911	4.43	5.07	13.17	4.66	2.10	11.61
1924	5.21	5.76	13.75	5.30	2.33	12.02
1930	4.99	3.95	12.12	5.11	2.27	11.90
1958	5.63	5.17	13.26	5.70	2.09	11.58
2104	4.71	5.32	13.39	5.09	3.19	13.34
2257	7.30	3.21	11.31	7.61	1.58	10.56
2315	5.21	-	-	5.61	0.87	8.64
2334	4.55	-	-	4.83	0.77	8.30
2352	3.96	0.30	5.12	4.38	0.71	8.08

Table 12. ε and u_* Values for 9 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0001	3.98	-	-	4.55	0.92	7.24
0026	-	-	-	4.78	2.15	11.69
0200	6.38	1.72	9.19	7.04	1.25	9.75
0220	5.63	0.12	3.75	6.22	2.66	12.56
0025	4.73	2.70	10.68	5.28	3.29	13.47
0240	5.39	2.52	10.44	5.98	3.65	13.94
0250	5.70	1.57	8.91	6.36	1.92	11.27
0254	5.18	1.45	8.69	5.82	1.78	10.99
0308	4.80	0.58	6.39	5.37	1.00	9.05
0356	4.88	0.69	6.79	4.95	0.78	8.35
0407	4.64	0.67	6.70	4.66	0.53	7.32
0452	4.52	1.10	7.91	4.90	0.78	8.33
0501	4.31	0.89	7.38	4.80	1.08	9.30
0522a	4.03	0.71	6.84	4.31	0.50	7.17
0522b	4.22	1.24	8.23	4.48	0.61	7.67
0548	3.98	1.81	8.11	4.23	0.49	7.14
0610	3.53	0.61	6.61	3.96	0.65	7.87
0706	4.19	2.45	10.34	4.55	2.91	12.94
0718	3.45	2.11	9.84	3.78	1.26	9.79
0742	3.21	2.82	10.83	3.46	1.17	9.56
0801	3.13	2.77	10.77	3.58	1.43	10.22
0832	2.93	5.26	13.33	3.78	5.02	15.51
0910	5.74	6.29	14.16	7.58	4.45	14.90
0920	7.34	4.59	12.74	5.65	1.74	10.90
0952	7.27	3.83	12.00	7.45	1.61	10.62

Table 12. ϵ and u_* Values for 9 August 1976 (cont'd)

TIME GMT	$\overline{U}_1$ (M/SEC)	ϵ_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ϵ_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
1058	6.38	1.45	8.68	6.78	1.02	9.11
1145	6.24	2.01	9.68	6.71	1.20	9.62
1230	5.04	0.71	6.85	5.21	1.15	9.50
1330	6.71	0.56	6.32	4.17	0.29	5.98
1400	4.69	0.95	7.54	5.09	0.80	8.41
1445	3.66	1.86	9.43	4.22	1.94	11.30
1545	2.85	-	-	3.28	0.40	6.67
1645	2.93	1.86	9.44	3.88	1.29	9.85
1736	2.95	1.88	9.46	3.63	2.43	12.19
1843	3.21	7.01	6.84	3.53	0.60	7.63
2044	3.41	0.13	3.90	4.26	0.25	5.68
2105	3.89	4.62	12.77	4.00	2.63	12.51
2113	4.05	6.74	14.48	4.36	4.72	15.20
2131	2.98	8.94	15.91	3.91	3.64	13.94
2147	2.93	-	-	4.50	4.85	15.33
2206	2.75	-	-	4.26	1.39	10.10
2305	3.43	-	-	4.64	0.88	8.69

Table 13. ε and u_* Values for 10 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ε_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ε_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0108	-	-	-	4.22	0.21	5.35
0156	4.80	1.01	7.68	5.65	1.04	9.17
1112	7.09	3.87	12.04	7.54	2.22	11.82
1741	3.46	6.23	14.11	3.58	3.40	13.63
1800	3.33	5.10	13.20	3.66	1.73	10.88
1810	3.61	5.41	13.46	3.78	1.78	10.98
1835	3.23	7.04	14.70	3.56	2.40	12.12
2044	6.41	7.11	14.74	6.99	-	-
2100	5.74	-	-	6.26	3.79	14.12
2125	5.51	-	-	6.50	4.64	15.12
2134	6.34	-	-	6.34	5.40	15.90
2200	6.94	18.00	20.10	7.14	-	-
2211	6.83	-	-	7.32	5.14	15.63
2230	6.48	14.31	18.62	7.72	6.39	16.81
2300	5.96	15.91	19.29	6.76	4.04	14.43

Table 14. ε and u_* Values for 11 August 1976

TIME GMT	$\overline{U}_1$ (M/SEC)	ϵ_1 (CM^2/SEC^3)	u_{*1} (CM/SEC)	$\overline{U}_2$ (M/SEC)	ϵ_2 (CM^2/SEC^3)	u_{*2} (CM/SEC)
0001	5.98	18.97	20.45	6.45	9.21	18.99
0106	7.51	19.18	20.53	7.82	9.12	18.93
0217	5.42	24.78	22.36	6.10	14.75	22.22
0238	6.10	13.64	18.32	6.85	-	-
0341	5.13	-	-	5.74	4.98	15.47
0348	5.25	-	-	5.84	7.13	17.44
0412	4.97	-	-	5.44	11.29	20.32
0425	4.52	-	-	5.30	6.58	16.98
0439	4.24	-	-	5.13	5.39	15.89
0447	4.50	-	-	4.71	3.56	13.83
0502	4.05	-	-	5.44	2.39	12.11
0522	4.85	-	-	5.46	1.20	9.63
0530	4.05	-	-	5.35	0.59	7.60
0551	3.63	-	-	4.71	1.26	9.79
0624	3.78	-	-	4.33	1.18	9.58
0639	6.12	-	-	6.81	1.44	10.23
0717	4.75	-	-	5.72	0.0059	1.64
0719	4.14	-	-	5.11	0.40	6.69
0731	4.36	-	-	4.80	0.11	4.40
0800	4.10	-	-	5.21	0.07	3.78

VII. TEMPERATURE STRUCTURE PARAMETER C_T^2 CALCULATIONS

Because of the recent interest in the propagation of optical beams in the marine boundary layer, calculations of the temperature structure parameter C_T^2 are made to provide information on its variation throughout the cruise. No attempt is made to present the values of C_T^2 with the existence or non-existence of fog or with thermal stability.

The most important parameter needed in describing a turbulent atmospheric path for an optical beam is the refractive index structure parameter C_n^2. For example, the log-amplitude variance σ^2 of a spherical wave, propagated over a horizontal path of uniform C_n^2 and length d is given by

$$\sigma^2 = 0.124\left(\frac{2\pi}{\lambda}\right)^{7/6} d^{11/6} C_n^2 \qquad (3)$$

where λ is the optical wave length.[1] The derivation of equation (3) is based on the power spectrum resulting from Kolmogorov's hypotheses previously mentioned and on perturbation theory. Its use is restricted to low power beams over propagation paths greater than the range of validity of geometeic optics, i.e., greater than $(L_o)^2/\lambda$ where L_o is the so-called inner scale of turbulence. For visible beams, it can be used when the propagation path length is greater than about 200 meters since L_o is of the order of a centimeter or less. The refractive index structure parameter C_n^2 is the variance of the refractive index variations. Friehe and LaRue[2] have derived an expression for C_n^2 involving the variance of temperature, the variance of humidity, and the co-variance of temperature and humidity, C_T^2, C_q^2, and C_{Tq}, respectively,

$$C_n^2 = aC_T^2 + bC_{Tq} + cC_q^2 \qquad (4)$$

where a, b, and c are coefficients depending on the mean values of temperature, pressure, and humidity. Equation (4) is valid for small fluctuations in temperature, pressure and humidity and actually neglects the effect of pressure fluctuations entirely. The values of C_T^2, C_q^2, and C_{Tq} can be related to the power spectra of temperature and humidity and the co-spectrum of T and q, respectively, as

$$\phi_T(k) = 0.25\, C_T^2\, k^{-5/3} \qquad (5)$$

$$\phi_q(k) = 0.25\, C_q^2\, k^{-5/3} \qquad (6)$$

$$\phi_{Tq}(k) = 0.25\, C_{Tq}\, k^{-5/3} \qquad (7)$$

where $\phi_T(k)$, $\phi_q(k)$, and $\phi_{Tq}(k)$ are spectral estimates at wavenumber k.

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1. Fried, D. L., Journal of the Optical Society of America, Vol. 57, No. 2, page 175 (1967)

2. Friehe, C. A. and LaRue, J. C., Dependence of Optical Refractive Index on Humidity and Temperature, presented at Topical Meeting on Optical Propagation Through Turbulence, Univ. of Colo., 9-11 July 1974.

Friehe, et al [3] found from over-ocean (FLIP) data that the temperature power spectrum accounts for practically all of the refractive index power spectrum. Therefore, equation (5) and equation (4) can be used to calculate values of C_n^2 where [4]

$$C_n^2 = 77.6 \times 10^{-6}(P/T^2)(1+\frac{0.00752}{\lambda^2})\, C_T^2 \qquad (8)$$

and P is atmospheric pressure.

The present analysis involves simply calculating values of C_T^2 using equation (5) and spectra of the type found in Fig. 7. Applying Taylor's hypothesis to equation (5) yields

$$C_T^2 = 4.0\, (\frac{2\pi}{\bar{U}})^{2/3}\, f^{5/3}\phi_T(f)$$

where $\phi_T(f)$ is the power spectral density of the atmospheric temperature fluctuations.

The calculated values of $\phi_T(20)$ and C_T^2 at both levels are presented in Tables 15 through 24. $\phi_T(20)$ refers to the power spectral density value at f = 20 Hz. The subscripts 1 and 2 again refer to levels 1 and 2 respectively. All values of C_T^2 are included where there is at least some section of the temperature spectrum which follows a -5/3 slope and where a corresponding value of $\bar{U}$ is available.

3. Friehe, C.A., et. al., Effects of Temperature and Humidity Fluctuations on the Optical Refractive Index in the Marine Boundary Layer, Journal of the Optical Society of America, Vol. 65, No. 12, Dec 1975.

4. Ochs, G.R., Bergman, R.R., and Snyder, J.R., Laser Beam Scintillation over Horizontal Paths from 5.5 km to 145 km, Journal of the Optical Society of America, February 1969.

Table 15. Values of $\phi_T(20)$ and C_T^2 for 31 July 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
2030	15	12	28	23
2230	1.5	0.69	-	-

Table 16. Values of $\phi_T(20)$ and C_T^2 for 1 August 1976

0039	-	-	0.20	0.094
0230	7.7	5.4	28.	19
0340	4.9	4.0	22	18
0430	1.2	1.0	7.1	5.9
0558	12.	5.6	17	7.2
0704	0.98	0.46	1.2	0.53
0830	0.98	0.53	2.2	1.1
0936	0.12	0.075	0.90	0.52
1312	2.4	1.2	-	-
1602	1.2	0.64	-	-
1821	0.24	0.16	-	-
2038	1.5	0.69	-	-
2245	0.98	0.47	-	-

Table 17. Values of $\phi_T(20)$ and C_T^2 for 2 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
0005	0.098	0.087	2.2	1.7
1341	0.98	0.62	-	-
1722	7.7	6.0	28	18
2200	19	15	17	10
2327	12	6.4	14	6.8
2346	3.9	2.4	8.0	4.6
2353	0.62	0.41	2.5	1.5
2359	0.62	0.37	2.5	1.3

Table 18. Values of $\phi_T(20)$ and C_T^2 for 3 August 1976

0005	-	-	-	-
0012	6.2	3.7	-	-
0023	3.9	2.6	-	-
0059	-	-	-	-
0107	-	-	-	-
0203	1.5	1.0	11	6.7
0220	12	9.1	14	7.7
0239	17	11	35	19
0247	17	11	2.2	1.2
0251	17	11	7.1	3.9
0300	6.2	4.7	17	9.3
0309	5.5	3.1	11	5.6
0322	31	14	0.71	0.29
0345	24	11	45	19
0400	24	12	40	17
0538	3	2.7	-	-
0603	4	3.8	-	-
0617	19	-	80	55

Table 18. Values of $\phi_T(20)$ and C_T^2 for 3 August 1976 (cont'd)

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
0712	9.8	7.5	17	12
1209	7.8	4.2	17	9.0
1457	7.8	3.6	22	9.2
1521	4.9	2.2	8.0	3.3
1547	0.22	0.097	1.4	0.57
1640	0.24	0.10	1.4	0.57
1840	0.39	0.16	1.4	0.53
1927	4.4	1.8	14	5.6
1936	6.2	2.5	14	5.3
1947	2.7	1.1	4.5	1.6
1955	2.4	1.0	9.0	3.3
2046	1.2	0.5	11	4.2
2054	3.9	1.4	17	7.4
2109	13	5.4	31	11
2140	12	4.7	28	10
2218	6.2	2.2	17	-
2330	4.4	1.7	14	5.1
2400	11	4.3	17	6.4

Table 19. Values of $\phi_T(20)$ and C_T^2 for 4 August 1976

0030	4.9	1.8	14	4.9
0100	3.1	1.1	8.0	2.6
0205	0.98	0.39	2.8	1.0
0230	-	-	0.18	0.10
0303	1.9	1.3	5.0	3.0
0400	0.78	0.57	2.8	1.5
0459	0.49	0.33	2.8	-
0534	2.7	1.7	5.0	-
0620	0.98	-	5.0	-
0954	1.2	0.66	3.1	-

Table 20. Values of $\phi_T(20)$ and C_T^2 for 7 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
1150	1.8	1.2	-	-

Table 21. Values of $\phi_T(20)$ and C_T^2 for 8 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
0300	-	-	0.58	0.50
0430	1.3	1.1	-	-
0457	0.82	0.70	-	-
0505	0.82	0.71	0.29	0.25
0526	0.82	0.66	0.58	0.45
0542	0.52	0.39	0.46	0.34
0620	0.82	0.59	0.29	0.20
0754	-	-	0.23	0.15
1028	-	-	0.46	0.25
1053	-	-	0.18	0.11
1130	-	-	0.29	0.15
1140	0.25	0.13	0.29	0.14
1200	0.65	0.30	0.81	0.35
1210	0.65	0.30	0.91	0.39
1303	1.2	0.28	1.8	0.74
1330	-	-	0.46	0.19
1407	1.3	0.56	1.1	0.49
1452	1.3	0.60	1.1	0.52
1552	2.0	0.96	1.8	0.86
1640	5.2	2.6	5.1	2.5
1755	4.6	3.9	2.0	1.6
1911	1.4	1.0	0.46	0.33
1924	1.1	0.77	0.51	0.34
1930	1.0	0.71	0.91	0.62
1958	3.8	1.3	3.8	1.3
1704	2.3	1.6	3.8	0.12

Table 22. Values of $\phi_T(20)$ and C_T^2 for 9 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $°C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $°C^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $°C^2/m^{2/3}$
0220	-	-	1.1	0.78
0225	2.0	1.4	1.2	0.85
0240	1.0	0.67	0.73	0.44
0254	1.3	0.87	0.91	0.57
0308	0.82	0.58	0.58	0.37
0356	-	-	0.51	0.35
0452	-	-	0.36	0.25
0501	-	-	0.29	0.20
0512	0.52	0.41	0.36	0.27
0522	-	-	0.32	0.24
0910	0.16	0.10	-	-
0952	-	-	0.91	0.47
1058	1.3	0.76	0.81	0.45
1145	1.6	0.97	1.1	0.65
1230	2.0	1.4	-	-
1330	0.52	0.43	-	-
1400	3.2	2.3	-	-
1445	1.6	1.3	0.91	0.70
1545	-	-	0.14	0.13
1645	0.52	0.51	0.81	0.66
1736	0.52	0.50	0.91	0.78
1843	0.92	0.85	0.81	0.70
2105	-	-	0.10	0.082
2113	-	-	0.058	0.044

Table 23. Values of $\phi_T(20)$ and C_T^2 for 10 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ $^oC^2$ sec	$C_{T_1}^2 \times 10^{-3}$ $^oC^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ $^oC^2$ sec	$C_{T_2}^2 \times 10^{-3}$ $^oC^2/m^{2/3}$
0108	0.41	0.29	-	-
1112	5.2	2.8	-	-
1741	2.0	1.8	-	-
1800	2.3	2.0	-	-
1810	2.0	1.7	-	-
1835	0.82	0.75	-	-
2044	2.0	1.3	-	-
2100	0.65	0.41	-	-
2110	2.6	1.5	-	-
2230	0.26	0.15	0.65	0.33
2300	2.0	1.2	1.8	1.0

Table 24. Values of $\phi_T(20)$ and C_T^2 for 11 August 1976

TIME GMT	$\phi_{T_1}(20) \times 10^{-6}$ °C^2 sec	$C_{T_1}^2 \times 10^{-3}$ °$C^2/m^{2/3}$	$\phi_{T_2}(20) \times 10^{-6}$ °C^2 sec	$C_{T_2}^2 \times 10^{-3}$ °$C^2/m^{2/3}$
0001	0.32	0.20	0.46	0.26
0106	1.4	0.76	0.81	0.41
0217	4.1	2.6	5.1	3.1
0238	0.41	0.24	-	-
0250	-	-	0.91	0.50
0259	-	-	0.91	0.51
0313	-	-	2.9	1.6
0329	-	-	1.1	0.71
0341	-	-	0.81	0.51
0348	-	-	1.4	0.90
0412	-	-	0.91	0.59
0425	-	-	0.91	0.60
0439	-	-	0.81	0.55
0447	-	-	0.91	0.65
0502	1.6	1.2	3.6	2.3
0522	-	-	0.51	0.33
0530	-	-	0.29	0.19
0639	-	-	0.91	0.51
0712	0.41	0.28	0.14	0.092
0717	0.82	0.58	0.29	0.18
0719	0.65	0.50	0.36	0.24
0731	1.0	0.78	2.3	1.6
8000	0.32	0.25	0.58	0.38

Atmospheric Electricity Measurements

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I. MEASUREMENTS

Measurements of electrical parameters were made during the cruise to test the atmospheric electric fog effect and to evaluate the usefulness of electrical recordings as indicators of atmospheric turbulent mixing. The fog effect has been studied by numerous investigators (see Dolezalek, 1963 and Anderson & Trent, 1966) with the general conclusion that a recording of atmospheric electrical conductivity does give a valid short term fog forecast, but there has been an almost total lack of simultaneous in situ micrometeorological and aerosol observations with which to augment the simple observed correlations. The existence of strong relationships between turbulent mixing in the boundary layer and atmospheric electricity has been long recognized. Codification of this into viable models has only now begun to occur, however (Anderson, 1976). The measurements aboard USNS Hayes were made in an attempt to evaluate existing analytical models and to gain insight where possible into improvements, corrections, and extensions to these models.

Measurements were made of atmospheric electric conductivity, space charge density, electrical "potential gradient", wind velocity fluctuations, and vertical motions of the ship itself. The instrument sensors were mounted atop a 15-foot tower mounted on the pilot house roof. The tower is shown in Figure 1. The positive and negative ion conductivities were measured with aspirated Gerdien-type cylindrical capacitors, the space charge density with an aspirated Obolensky filter, and electrostatic potential with a Polonium probe antenna 2.2 m above the tower; wind fluctuations were measured with two hot wire sensors at tower top, and ship motions were monitored with a vertical axis accelerometer and a vertical rate gyro. All data were passed through low pass filters to preclude aliasing problems, and the filtered analog signals were sampled, digitized, and recorded at a rate of one scan per second in the computer facility. A second set of filters, scanners, and digitizers was available for occasional use in which the recording was accomplished at a rate of 100 scans per second. The rate of tape consumption at this data rate limited its use to infrequent short periods.

Programs were included in the computer system with which to obtain real time displays of any one recorded parameter, and with which any parameter might be analyzed for its Fourier power spectrum. Both cathode ray oscilloscope and hard copy displays of these analyses were available as required. All the data was recorded on digital magnetic tape for subsequent analysis.

Even at the low rate of one scan per second, a volume of observations is accumulated which precludes any total presentation in this report. What has been done, therefore, is to select several situations in which the ship passed into a fog and show some representative data traces centered on the time of entry into the fog and then to present some analysis and discussion of this data. Analysis of the remainder of the observations is continuing with emphasis on quantitative identification of correlations between the various electrical parameters and between them and observed micrometeorological data.

II. DATA

Three fog events were selected for display. Their onset times were roughly 8 August 1600, 8 August 1900, and 9 August 1700, Eastern Daylight Time. The data recordings were found to be strongly contaminated by noise impulses whose occurrences correlated to some extent with radio transmissions from the ship. The recordings of conductivity, electrostatic potential, and space charge density for these three fog events have been plotted for a four-hour period centered on the onset time and are shown in Figures 2-13.

In order to obtain valid Fourier power spectra of these parameters, time periods within the displayed intervals were selected which were free of impulse noise. The resultant spectra are presented in Figures 14-25. Finally, typical spectra of vertical acceleration and velocity are shown in Figures 26 and 27, respectively. The dominant periodicity of the ship motions is quite apparent in these analyses.

III. DISCUSSION

It would be both foolhardy and impossible to attempt a thorough analysis of the results on a fractional sample as small as that presented herein. Nevertheless, a few obvious comments should be made. The first is the urgent need to eliminate or suppress the noise spikes. Preferably this should be accomplished at the source if possible through extensive use of shielding and bypassing; but in the likely event that such measures do not eliminate the problem, a computational algorithm must be developed with which to suppress data so contaminated. A decrease in negative conductivity is seen at about 0645 on 8 August which is in the form of the "classical" fog precursor.

The power spectra of electrostatic potential and space charge density shown in Figures 14-25 exhibit several interesting features. A strong effect by ship motions is apparent in Figures 18-21 while absent in the rest. This indicates the necessity of recording ship motion data whenever any sampling process is employed which might depend in any manner upon height and/or orientation. It is plausible that even mechanical collection devices will vary their efficiencies as the exposure and aspect is altered. It is also seen that the fluctuation magnitudes show variations which seem to be dependent on time of day rather than on fog versus no fog. The spectral amplitudes are greater at 0900 and 1510 than at 0600 and 1805 on 8 August,

even though this yields no correlation with fog existence. There seems to be a greater level of activity in the midday hours. No spectra of conductivity data were computed in time for inclusion in this report, but it was possible to see the influence of ship motion in these also. It should also be noted that a few of the spectra apparently do not roll off as rapidly with frequency as might be expected. This could be the result of noise impulses which did not appear on the time plots because of the averaging used in their preparation. A final analysis must therefore test the raw data with some noise detection algorithm if valid spectra are to result.

In conclusion it must be stated that the data presentations given here represent only a fraction of that which is possible and represent the author's specific needs and interests. The complete data recordings exist as described and can be made available in some reasonable form to other users. Analyses presently contemplated include computation of correlation spectra between parameters, attempting to establish relationships between this data and observations of other parameters, and the removal of obvious processes such as ship motion to expose phenomena whose existence might be masked by the amplitude of the motion's effect.

References

Anderson, R. V., Atmospheric Electricity in the Real World, in H. Dolezalek and R. Reiter (eds): Atmospheric Processes in Atmospheres, Darmstadt, 1977.

Anderson, R. V. and E. M. Trent. Evaluation of the Use of Atmospheric-Electricity Recordings in Fog Forecasting, NRL Report 6426, 1966.

Dolezalek, H., The Atmospheric Electric Fog Effect, Reviews of Geophysics 1, 1963.

Figure 1. Photograph of instrument tower aboard USNS Hayes showing atmospheric electricity sensors.

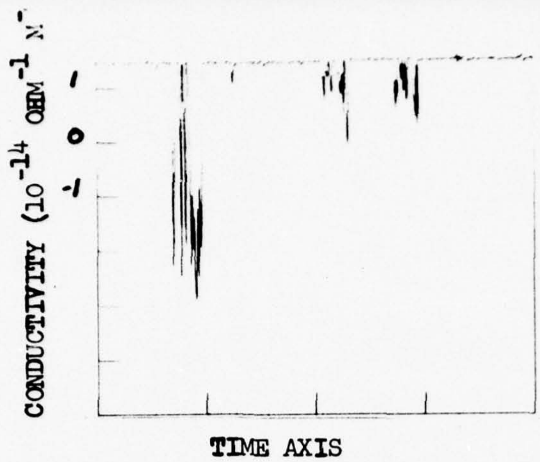


Figure 2. Positive conductivity 0600-1000 EDT 8 August 1975.

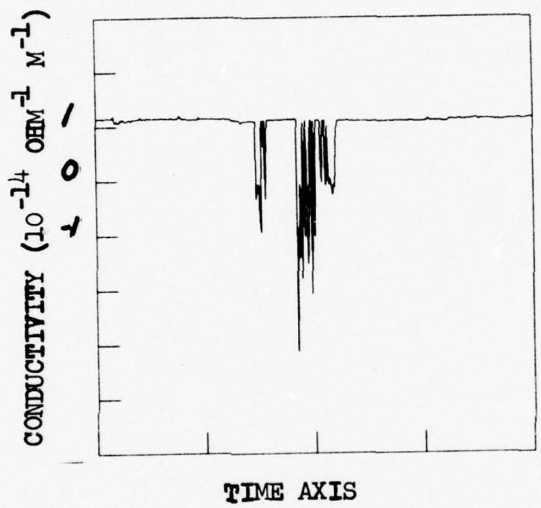


Figure 3. Positive conductivity 1700-2100 EDT 8 August 1975.

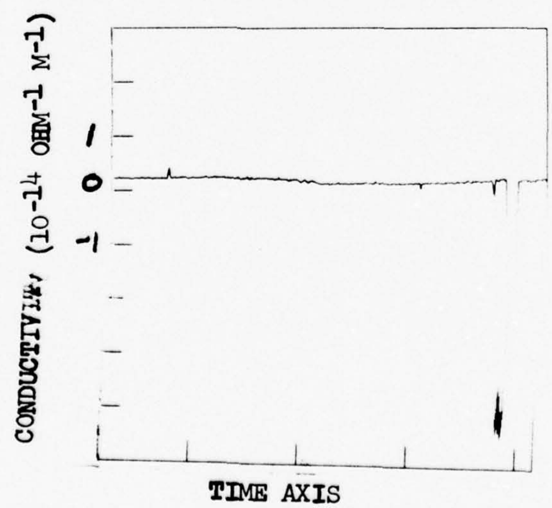


Figure 4. Positive conductivity 1510-1910 EDT 9 August 1975.

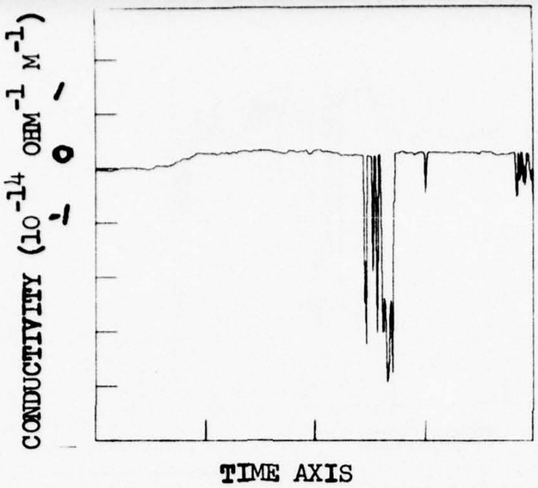


Figure 5. Negative conductivity 0600-1000 EDT 8 August 1975.

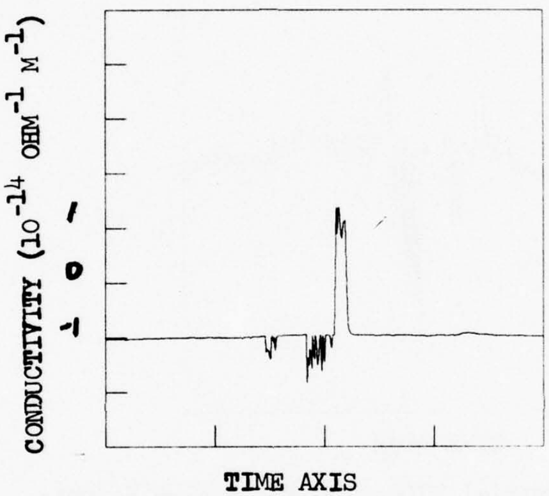


Figure 6. Negative conductivity 1700-2100 EDT 8 August 1975.

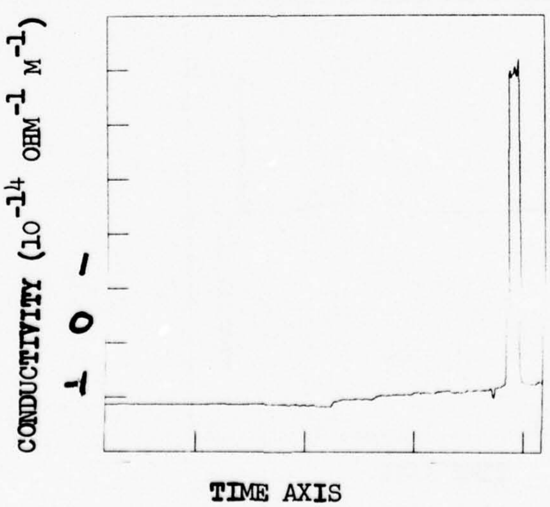


Figure 7. Negative conductivity 1510-1910 EDT 8 August 1975.

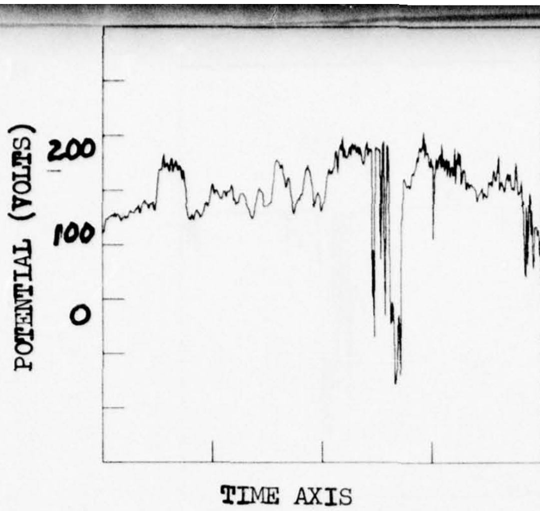


Figure 8. Electric potential 0600-1000 EDT 8 August 1975.

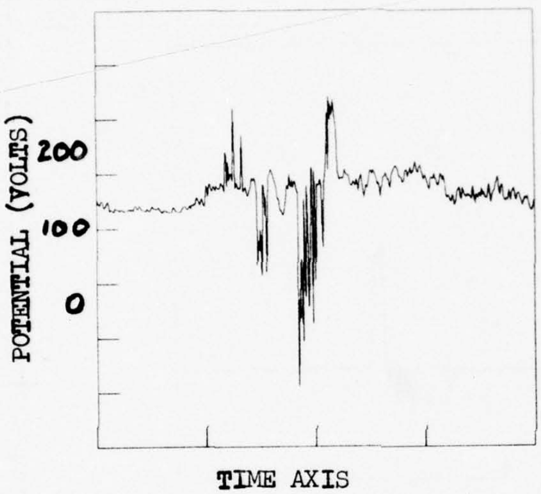


Figure 9. Electric potential 1700-2100 EDT 8 August 1975.

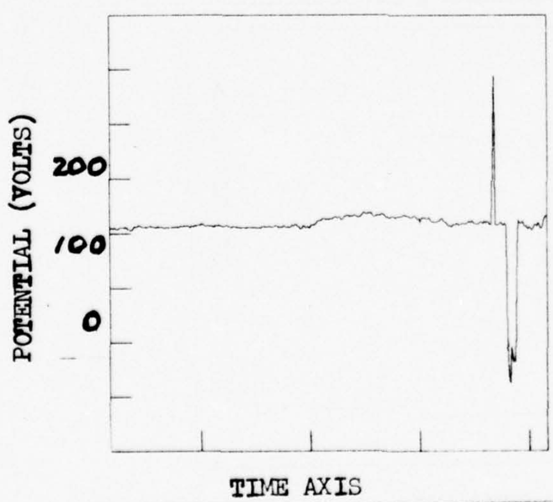


Figure 10. Electric potential 1510-1910 EDT 9 August 1975.

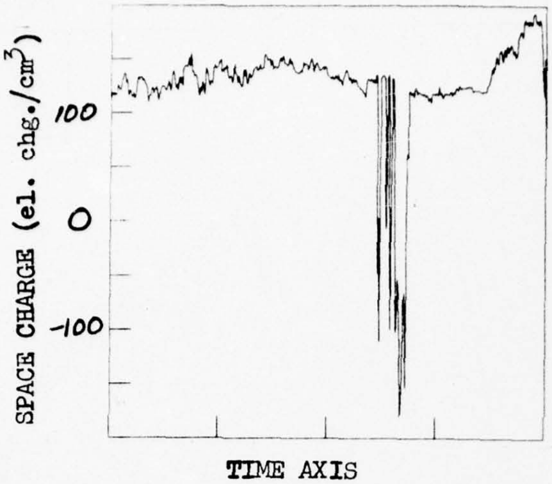


Figure 11. Space charge density 0600-1000 EDT 8 August 1975.

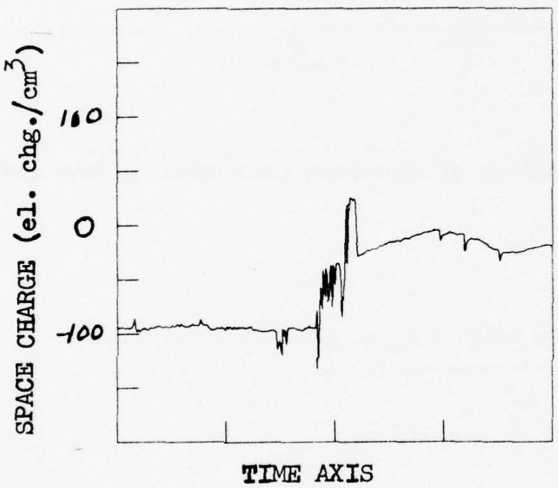


Figure 12. Space charge density 1700-2100 EDT 8 August 1975.

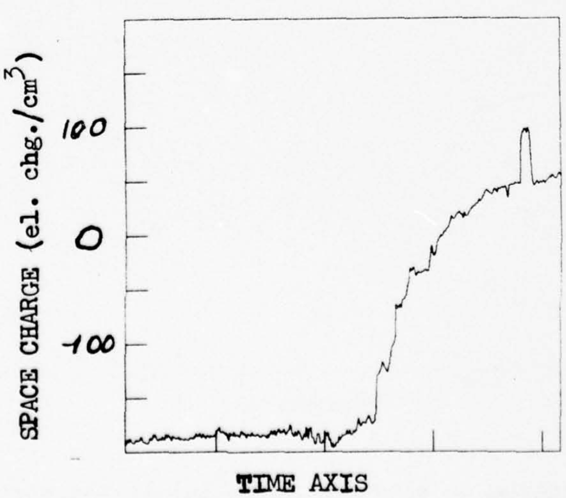


Figure 13. Space charge density 1510-1910 EDT 9 August 1975.

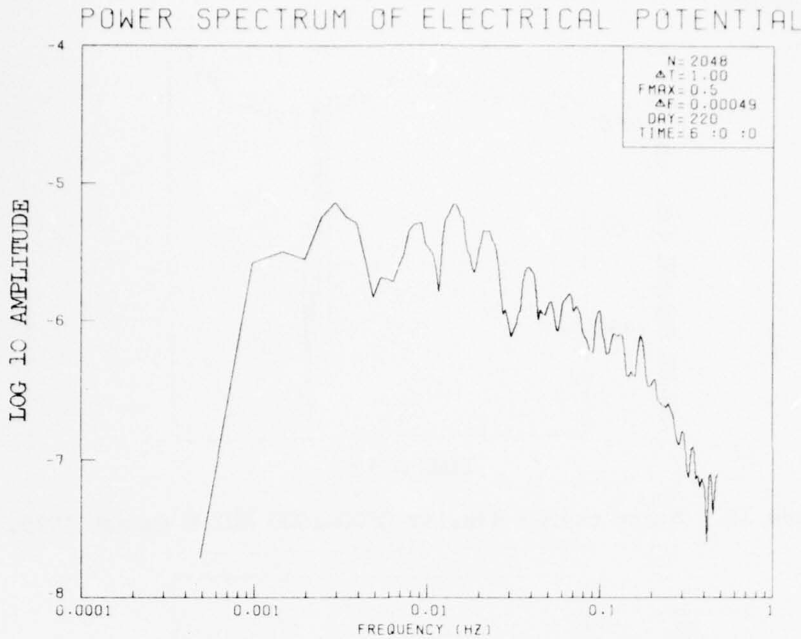


Figure 14. Power spectrum of electric potential in the morning of 8 August before fog.

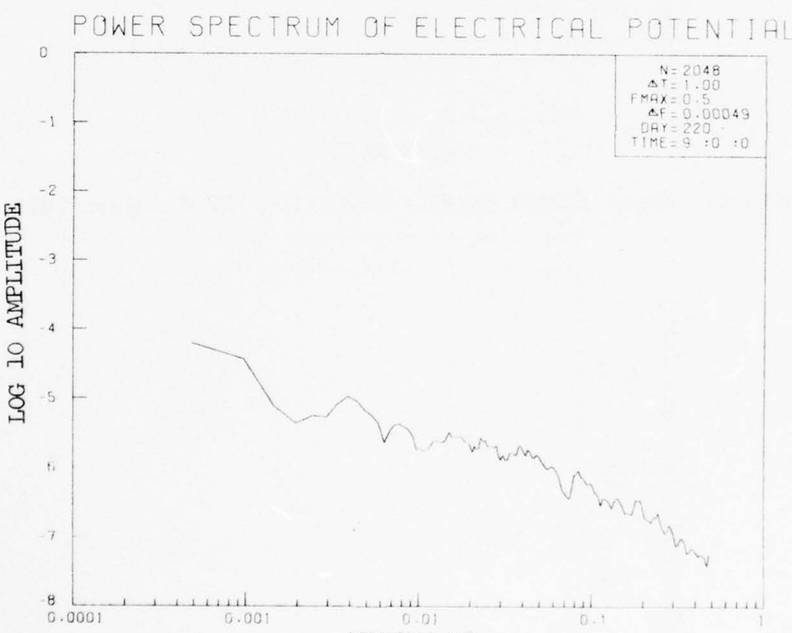


Figure 15. Power spectrum of electric potential in the morning of 8 August in fog.

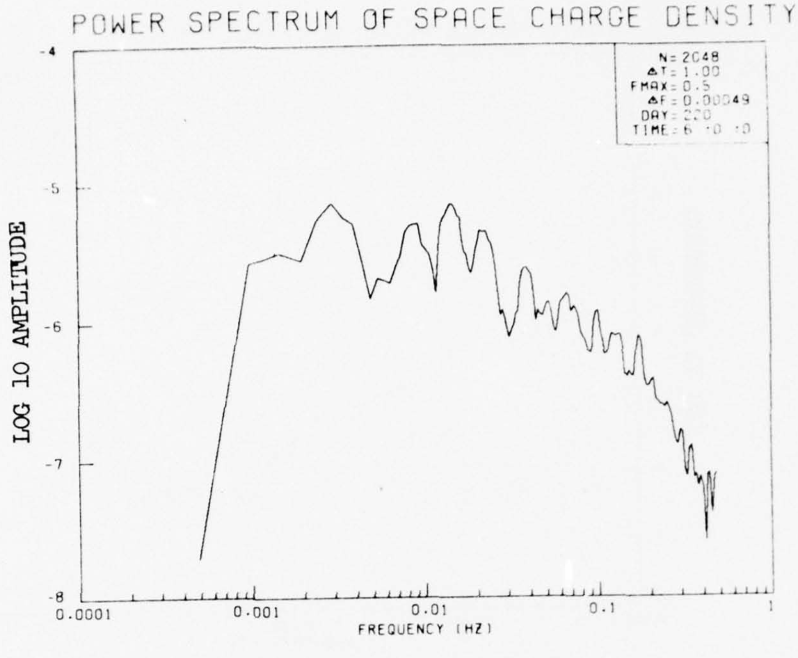


Figure 16. Power spectrum of space charge density in the morning of 8 August before fog.

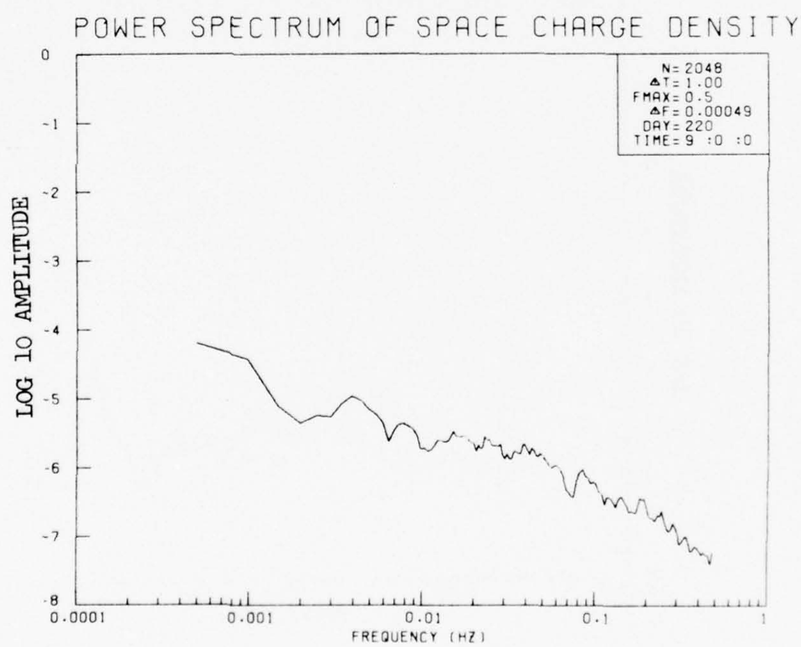


Figure 17. Power spectrum of space charge density in the morning of 8 August in fog.

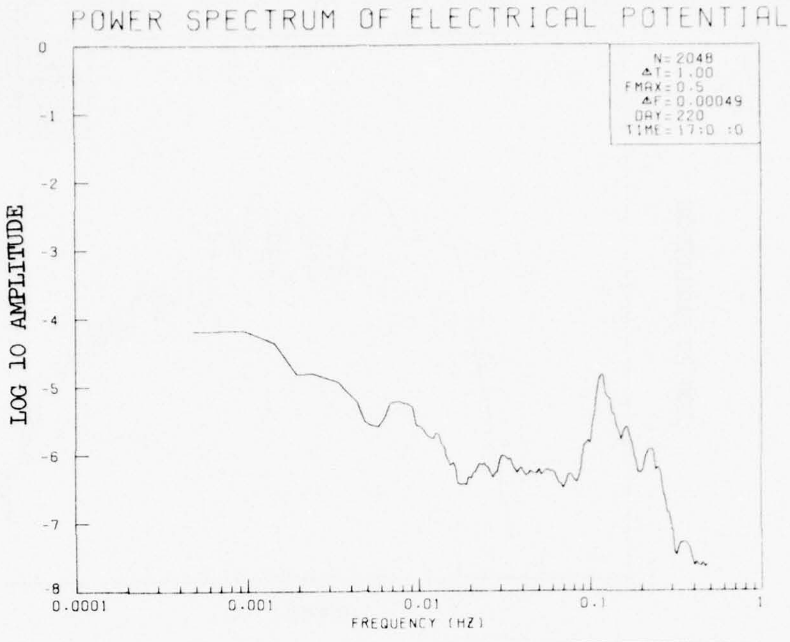


Figure 18. Power spectrum of electric potential in the afternoon of 8 August before fog.

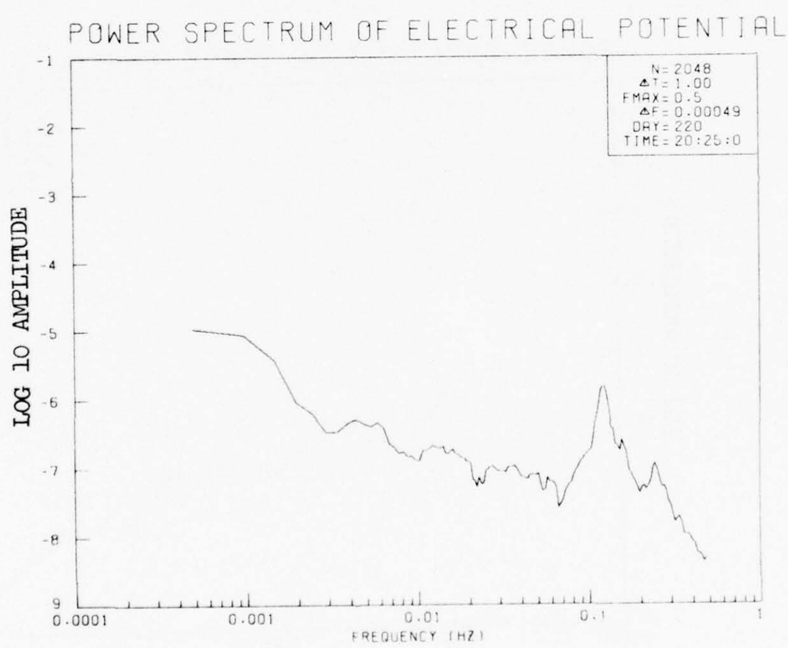


Figure 19. Power spectrum of electric potential in the afternoon of 8 August in fog.

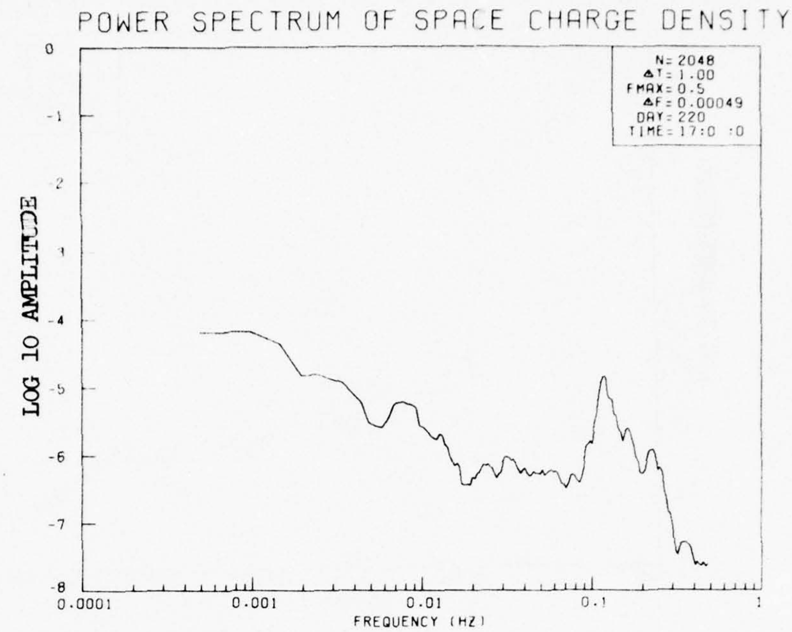


Figure 20. Power spectrum of space charge density in the afternoon of 8 August before fog.

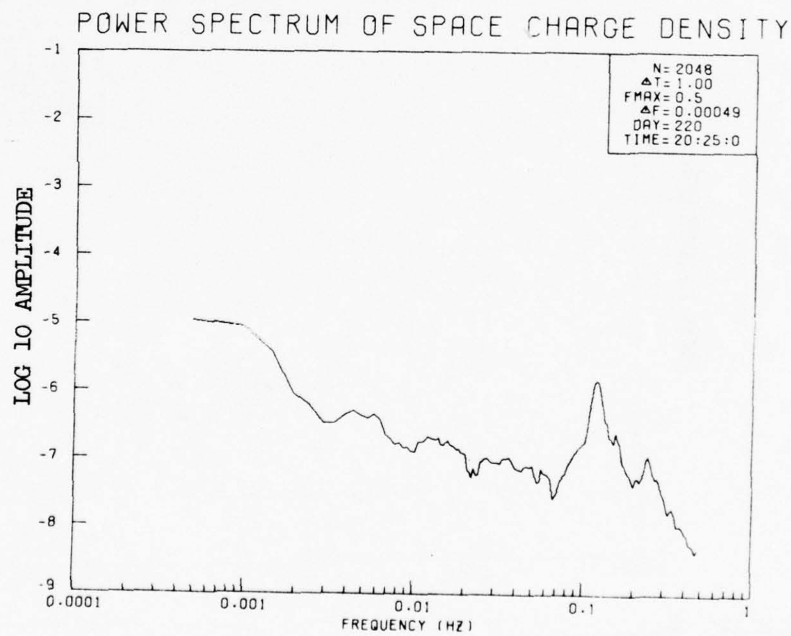


Figure 21. Power spectrum of space charge density in the afternoon of 8 August in fog.

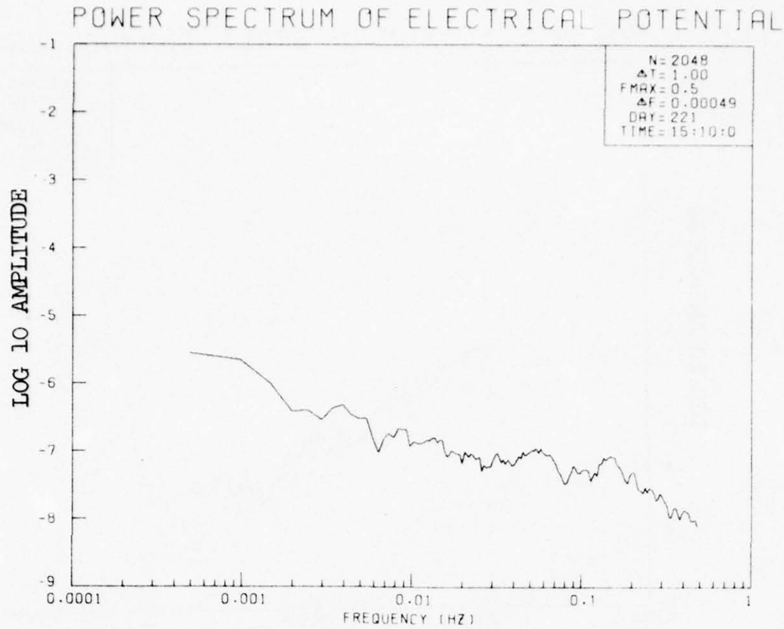


Figure 22. Power spectrum of electric potential on 9 August before fog.

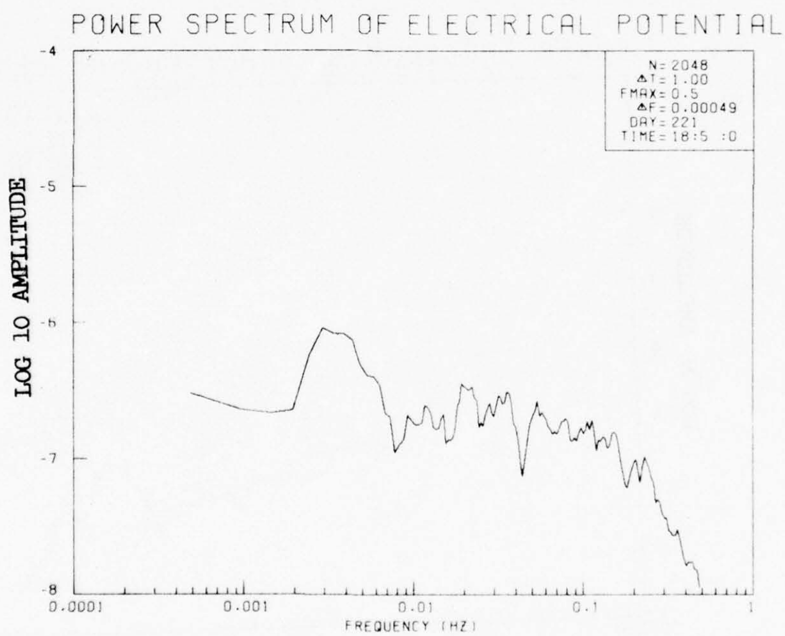


Figure 23. Power spectrum of electric potential on 9 August in fog.

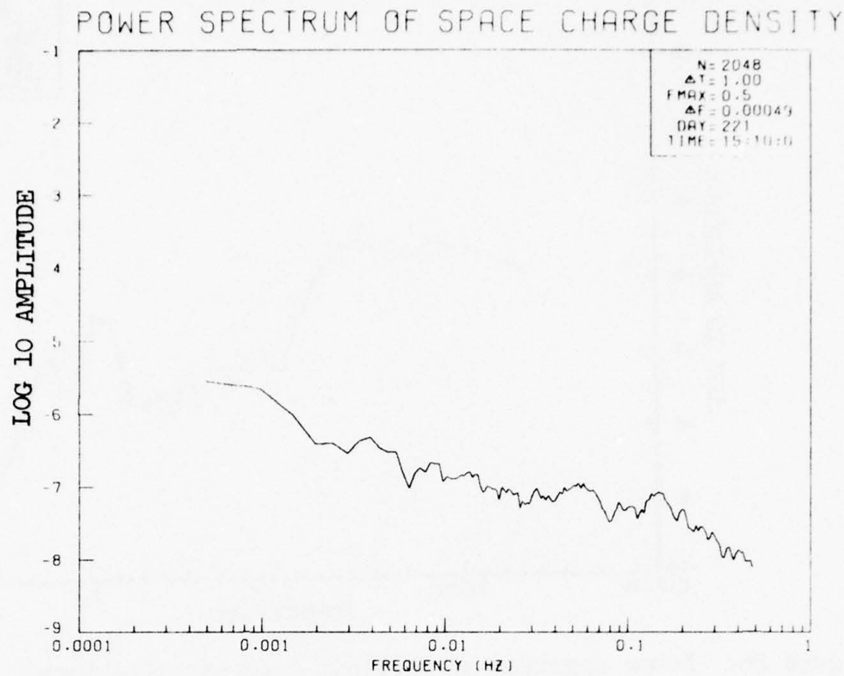


Figure 24. Power spectrum of space charge density on 9 August before fog.

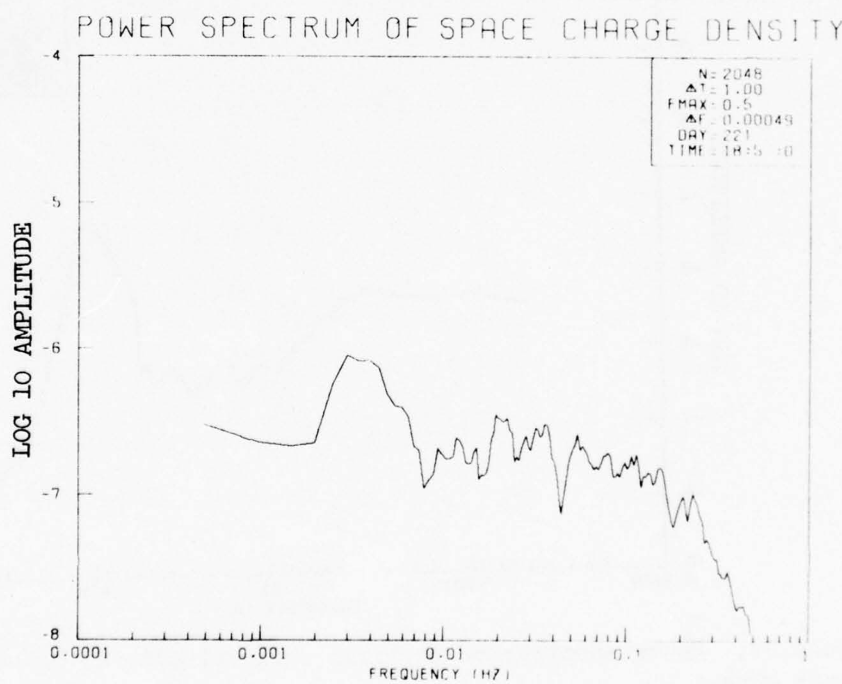


Figure 25. Power spectrum of space charge density on 9 August in fog.

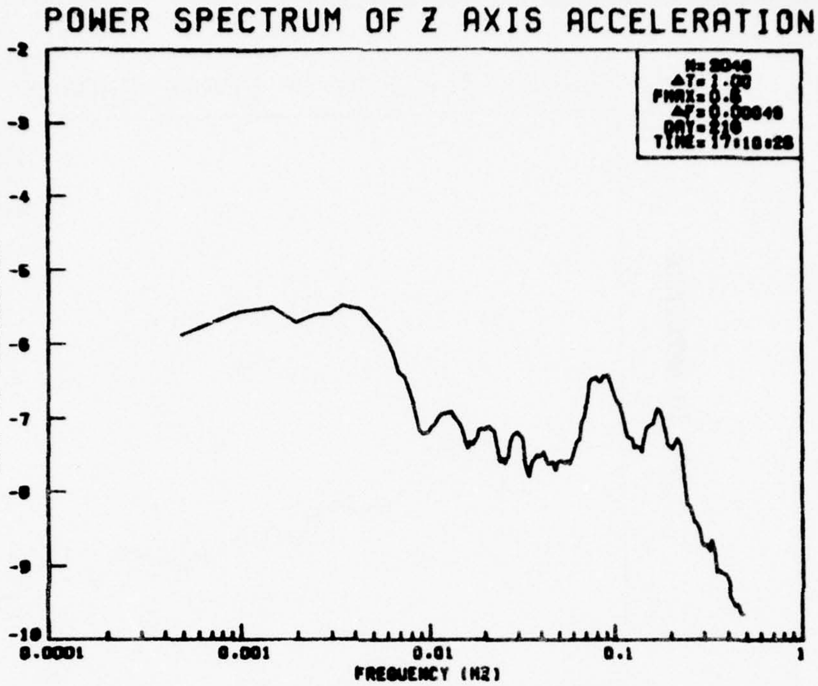


Figure 26. Power spectrum of vertical axis accelerations.

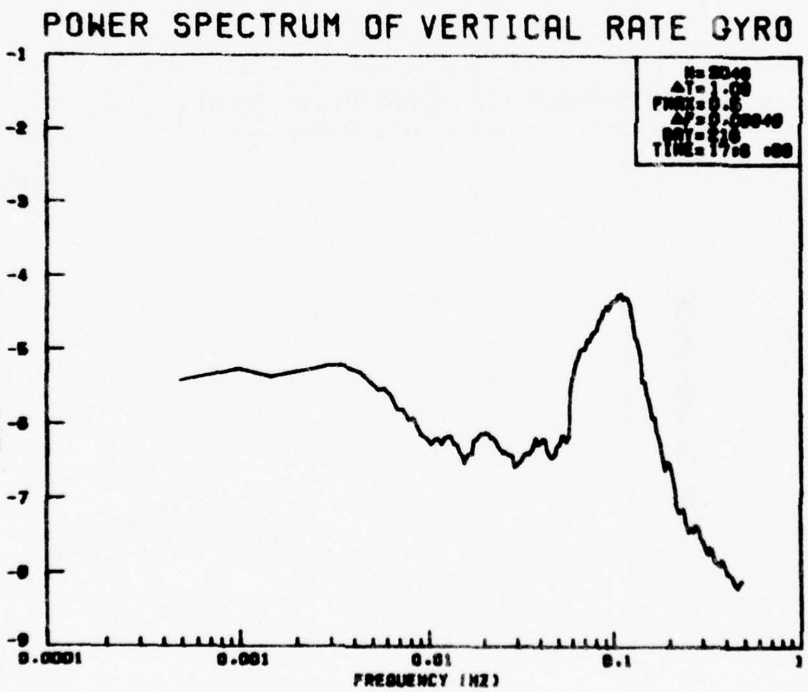


Figure 27. Power spectrum of vertical ship velocity as measured with a rate gyro.

Fog Chemical Data
Hayes Fog Cruise of July-August 1975

David J. Bressan
Chemical Oceanography Branch
U. S. Naval Research Laboratory

The Chemical Oceanography Branch of the Naval Research Laboratory has been supporting studies of the chemistry of marine aerosols and related parameters, with real-time evaluation of the chemical nature of these aerosols as a primary goal. Modern studies of marine fogs have generated an interest in the chemical nature of aerosols which act as condensation nuclei. This report presents chemical and related data collected during the July-August 1975 Fog Research Cruise of the USNS Hayes. The instruments were located above the pilot house unless otherwise specified.

RELATED DATA

A Gardner Aitkin Nuclei counter was used to evaluate particle numbers at two hour intervals, Fig. 1. In general these numbers are above 1,000 when continental air is encountered at sea, between 200 and 400 for relatively clean marine air, and below 150 when in fog.

A model 1560 MRI Integrating Nephelometer, with a heating tube, provided the data shown in Fig. 2. This was hand digitized to ± 0.05 units from a strip chart recorder at hourly intervals, or at shorter intervals when short term peaks were encountered. Unlike for the Gardner counter, the presence of fog or haze does not mask the particle counts, as the measurements are made on the scattered light from the dried particles. Readings above about 0.2 are interpreted as indicating the presence of continental air, while pure marine air gives readings below about 0.1. However, relatively large numbers of sea salt particles can give slightly elevated readings, and continental dust gives the higher readings above around 1.0. Ship's exhaust would register as a very high peak, but is normally excluded from the instruments except possibly during some turning maneuvers or a strong wind from the rear. There were no apparent occurrences of this on the record. The strip chart recorder for this machine runs 2" per hour and also includes a temperature reading of the air inside the nephelometer, for monitoring the heating element. Xerox copies of any portion of this strip chart as well as the other strip charts and data referenced in this section of the report can be obtained from this author or through the editors.

A pair of mercury thermometers, one wet and one dry bulb continuously aspirated by a muffin fan, was used to make the measurements leading to the calculated total water vapor load of the air as shown in Fig. 3. It should be noted that these thermometers were not completely protected from solar heating, but total water vapor calculations can be made independently of this.

Also shown in Fig. 3 is temperature data taken with a Barnes Instrument Co. PRT-10L infrared radiometer. The graph shows the differences of sea surface temperature minus the overhead sky temperature as seen by the device. The overhead temperature is usually that of the base of overlying stratus or cumulus cloud cover.

The data for Fig. 3 were taken at two-hour intervals on a log sheet, which includes additional infrared radiometric temperatures at -10°, $+10^{\circ}$, $+30^{\circ}$, and $+60^{\circ}$ with respect to the horizon, the wet and dry bulb temperatures with calculated % RH and total water vapor load, the Gardner counts, % cloud cover, % white cap coverage, eyeball estimates of visibility, the ship's and relative wind's speed and heading, and comments.

SALT DATA

For this cruise a device was designed and constructed to continuously collect fog samples and to measure the conductivity and volume of the fog water collected by 2 ml increments.

In operation, foggy air is sampled at the rate of 40-42 M^3/10 min., passing through two nylon meshes in tandem on which the fog is collected. The water runs down into a conductivity cell which fills to 2 ml volume before being emptied by a siphon, which is self-primed when the water in the cell reaches the proper level. The time needed for acquiring 2 ml to fill the cell is seen by the buildup of the conductivity reading, and takes 2 to 20 minutes depending on fog density. Since the cell empties in 3 to 5 seconds, the time between successive downward-going spikes (cell emptyings) is essentially the filling time. From these numbers it can be seen that each downward-going spike in a 10-minute period represents 0.050 g of liquid water/m^3 of foggy air. The output is expressed as NaCl concentration of the solution, not its conductivity, due to calibration of the system with NaCl standard solutions.

Figure 4 shows the strip chart output record for this device over the period specified. Calibrations for salt content of the fog water are shown at the right. Note that time moves from right to left at 2"/hour, and that the real-time data shows both the length of time to acquire 2 ml of liquid water and the salt concentration of that water as surmised from its conductivity. An algorithm was also devised for computing ug salt/M^3 of air from the strip chart. It is simply: ug salt/$M^3 \approx$ ug NaCl/ml x (1/spacing between successive downward-going spikes, in 64ths of an inch) x 1.06, for a strip chart spacing of 2"/hr.

All the computations of (salt and water)/M^3 air have been tabulated on an hourly basis and presented graphically in Figures 5-11 for those periods during which the device operated effectively.

CHEMICAL DATA

The fog samples collected by the device mentioned in the previous paragraph were analyzed for most of the major ionic components and are presented as samples 1-15 of Table 1. Samples 16-22 of that Table are from a

fog-collecting panel of $1M^3$ nylon (1,2) mesh of the type used in the fog conductivity meter. The mesh panel was exposed on the right bow jack-staff of the HAYES about 9 meters above the water line, while the fog conductivity meter was on top of the pilot house, collecting samples about 16 meters above the water line. This sampler, however, may have caught rising air from the 12-meter level pushed by the ship's motion. This is inferred (Dr. Jeck, personnel communication) from wind tunnel tests. However, there are questions involved in linear scaling from the model to the real ship, but generally, the higher level samples represents a 1.5 to 1.8 height scale factor above the lower level. Also, the mesh panel collected water at rates up to 1200 ml/hour while the fog conductivity device collected at rates up to about 180 ml/hour.

Each sample was checked for conductivity with a Hach portable conductivity meter from which the estimate of an expected sodium chloride concentration was made (Col. 4). In the laboratory, unfiltered samples were analyzed for sodium and potassium (Cols. 6&8) by atomic absorption (1,3) spectrophotometry, and from that result was computed a percentage (Col 7) of sodium found (Col 6) in proportion to that expected from conductivity (Col 5). The sodium/potassium ratio was also computed (Col 9). Column 10 presents the results of titrations of chloride by the Volhard method and a mercury titration method using diphenylcarbazone as a colorimetric indicator. The Volhard method is useful to 30 ppm with about $2\sigma = \pm 4$ ppm, while the mercury method was useful to 2 ppm with about $2\sigma = \pm 0.5$ ppm. Column 12 gives the $SO_4^{=}$ determined by a Barium nitrate titration followed by a turbidometric measurement. Two σ error turned out to be $\pm$ 2 ppm or 12%, whichever was smaller for the range of 3 to 75 ppm $SO_4^{=}$. Cl^-/Na and SO_4/Na ratios are given in Columns 11 and 13. The pH of each sample was determined by the glass junction electrode and is given in Col. 14.

Some note should be given regarding the data, especially for items in the Table marked (1), starting with the bottom line which gives the average results for sea water of $35^o/00$ salinity.

Sodium and potassium found by atomic absorption spectrophotometry (AAS) can be more than just ionic material in some cases, even though ~~the~~ samples are liquid. It is thought that these elements are also detected when they occur in organic particles, and some fraction, if not 100%, of their mass in dust is also seen by the AA spectrophotometer. With this characteristic of AAS analysis in mind, it should be pointed out that its analytical results agree well with those obtained by neutron activation analysis for duplicated samples, passed through 0.45 u millipore filters (4). Therefore, columns 6 and 8 are headed Na and K, and not Na+ and K+ respectively, and any nonionic Na and K will effect the Na/K ratio in Col. 9, yielding additional information to aid in the interpretation of the chemical history of the aerosol. Note that if sea water solutions are measured for conductivity and sodium content, only 76% of the sodium expected by conductivity is actually found, although salt mass concentration to conductivity relationships are nearly the same for both sea water and pure NaCl solutions.

It is expected that pH is only accurate to ± 0.5 pH units. These samples were observed to contain viable biological material (5) which has been reported to interfere with pH determinations by the glass electrode. This response was reported by Dr. Baier of Calspan Corporation (personnel communication) and he noted it in human body fluids. It is characterized by slow and less reproducible response of the pH meter when measuring these samples as compared to known buffer solutions. Therefore, since pH is proportional to the log of the concentration of hydrogen ion, the large uncertainty make these measurements useless for computing a charge and conductivity balance.

The Cl/Na ratios are what we would expect when sampling marine aerosols and rain or fog conditions (2).

The data in the Table show the following characteristics of the aerosols incorporated in the fog. The bow (fog kite) samples tend to show more salt than the pilot house (conductivity meter) samples. All samples contain sea foam spray, with some of the lower samples showing evidence of bulk sea water (probably large drops, due to ship's motion or wind spray). The elemental analyses indicate that most samples contain some dust. In some, like numbers 6, 10, 13, the dust is relatively inconsequential, while in others, like numbers 1-5, it is quite evident. The high $SO_4^=$/Na ratios in almost all the samples are interpreted as evidence of industrial pollution. Some bow level fog samples show substantially lower $SO_4^=$/Na ratios than pilot house samples taken at the same time. If it is assumed the Na comes from the sea surface and the excess $SO_4^=$ comes from land, vertical mixing is implied. Therefore, when comparing number 8 with number 2, or number 4 with number 18 or number 19, the factor for the decrease in Na with altitude is about 1.5:1 to 2.5:1. This implies a vertical distance through which the relative concentration of Na is halved to be between 3m and 8m with a 50% error due to inadequacies of the data. However, this does show for these samples a rather steep concentration gradient near the sea surface.

Since the fog conductivity meter sampled at a constant rate of 40 M^3/10 min., overall comparisons can be made between samples 1-15 in Table 1, and figures 5-11, which show short-term variations in salt content of the air. From the figures, one can estimate at what times the bulk of the salt was acquired by the sampler, although each chemical sample is time-integrated over the period of acquisition and the chemical data is an average for the period.

First, it can be noted that the salt concentration of the fog waters is independent of the liquid water concentration of the air.

Also, there are times when the salt concentration of the air and the liquid water concentration of the air reach simultaneous maxima, and some of these events occur when salt concentration of the fog water is at or near a minimum. These latter few observations are consistent with the conclusion that higher salt loadings of the air may somehow enhance the water condensation rate in the air. (Occurrences of alternate situations show that these observations are not produced as an artifact of the collection system). However, one would expect random events to show concurrence

some portion of the time. Therefore, these latter observations demonstrate necessary but insufficient evidence for the conclusion that salt loading affects the condensation rate.

These and future fog events must be studied on an individual basis, where other variables such as direction of wind and ship motion, age of the fog droplets, and the general history of the fog event can be compared and accounted for. This is necessary to determine if the air's salt load is a true controlling variable for any aspects of fog or haze formation processes.

References

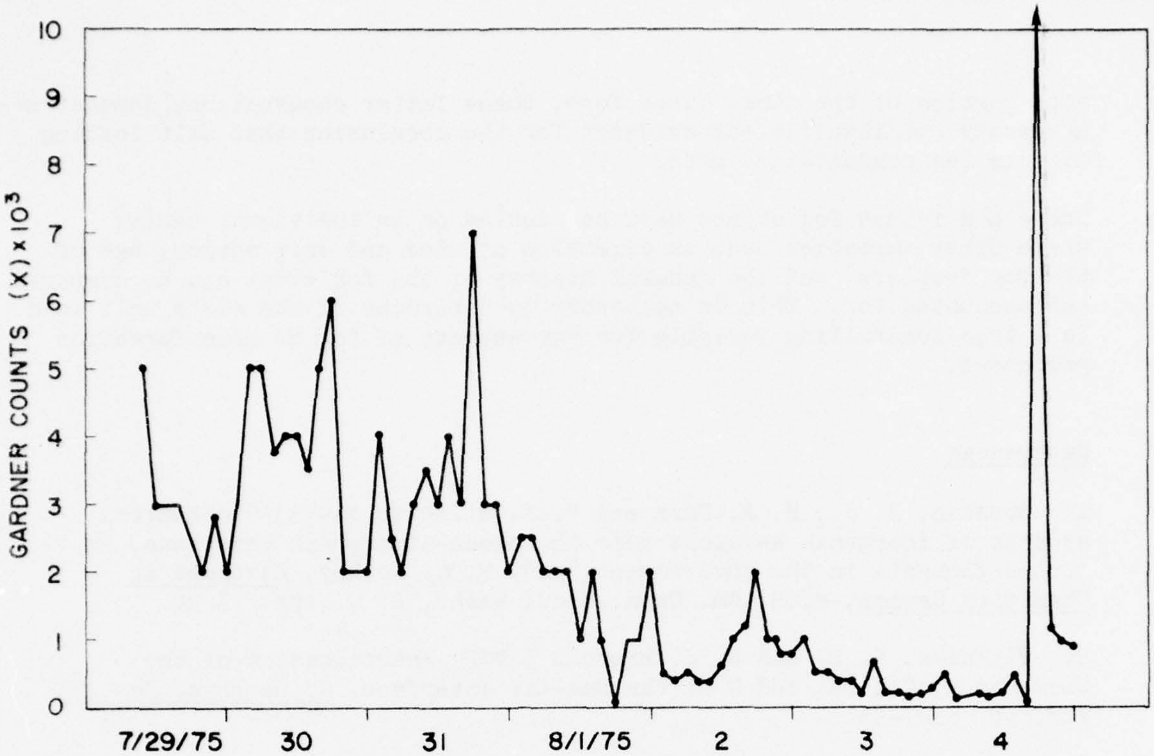
1. Bressan, D. J., R. A. Carr and P. E. Wilkniss (1973) Geochemical aspects of inorganic aerosols near the ocean-atmosphere interface, in, "Trace Elements in the Environment," ed. E. L. Kothny, Advances in Chemistry Series, #123, Am. Chem. Soc., Wash., D. C., pp. 17-30.

2. Wilkniss, P. E. and D. J. Bressan (1972) Fractionation of the Elements F, Cl, Na, and K at the Sea-Air Interface, J. Geophys. Res. 77, #27, pp. 5307-15.

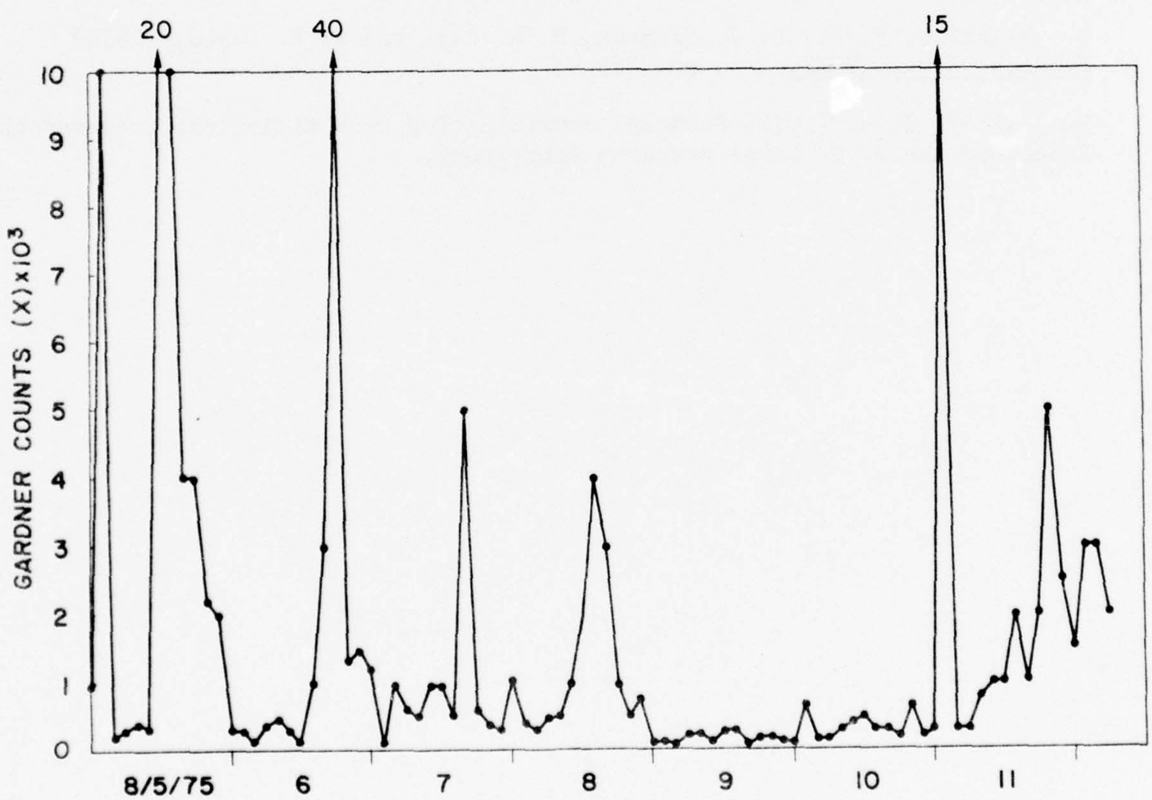
3. Perkin-Elmer Corp. (1971) Analytical methods for atomic absorption spectrophotometry, Norwalk, Conn.

4. Wilkniss, P. E., D. J. Bressan, R. A. Carr and R. E. Larson (1974) J. Rech. Atmos. VIII, 3-4, pp. 883-93

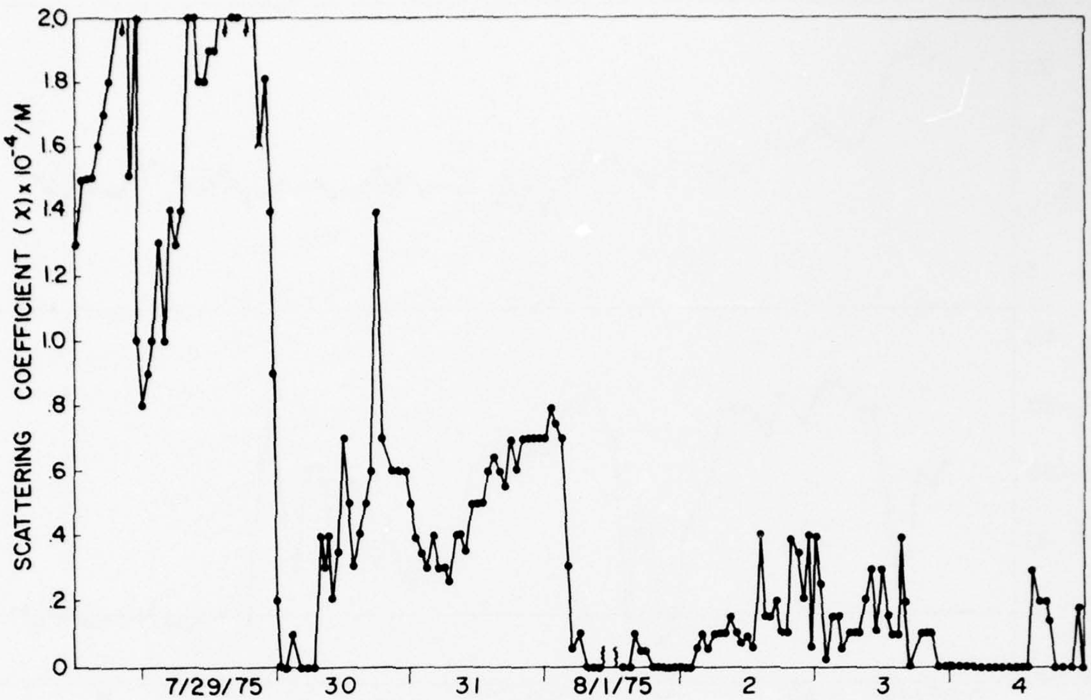
5. Bailey, C. A. (1976) Personal communication from Biological Oceanography Branch of the U. S. Naval Research Laboratory.



GARDNER COUNTS (X) x 10³
10
9
8
7
6
5
4
3
2
1
0
7/29/75
30
31
8/1/75
2
3
4



20
40
15
GARDNER COUNTS (X) x 10³
10
9
8
7
6
5
4
3
2
1
0
8/5/75
6
7
8
9
10
11


SCATTERING COEFFICIENT (X) x 10^{-4}/M
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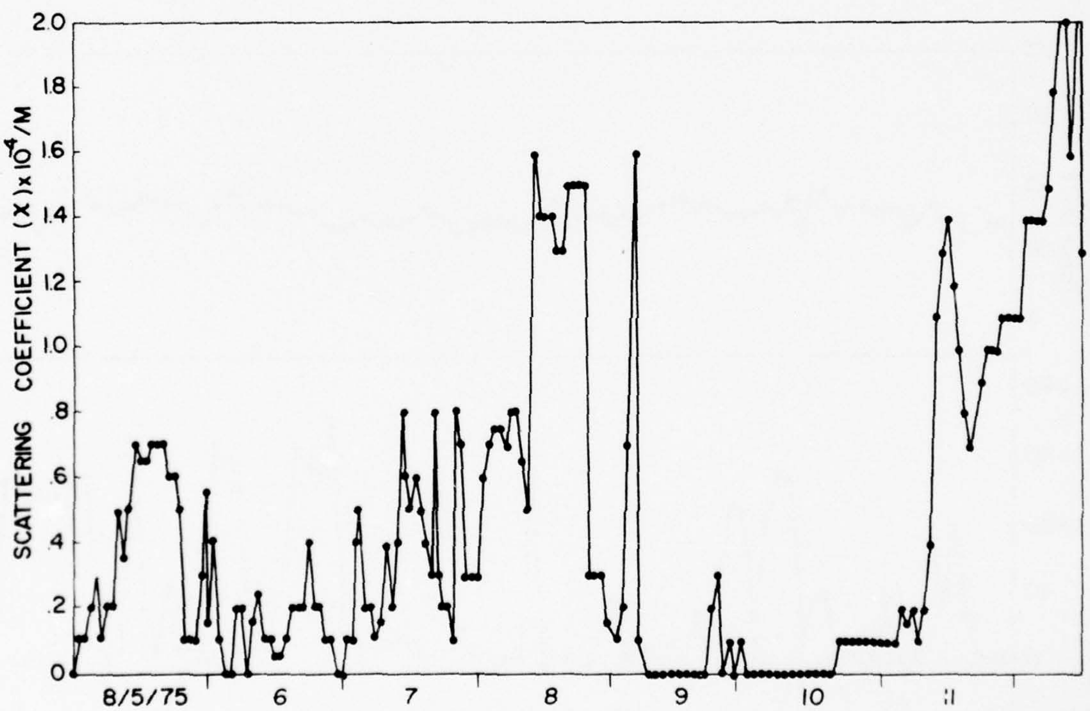
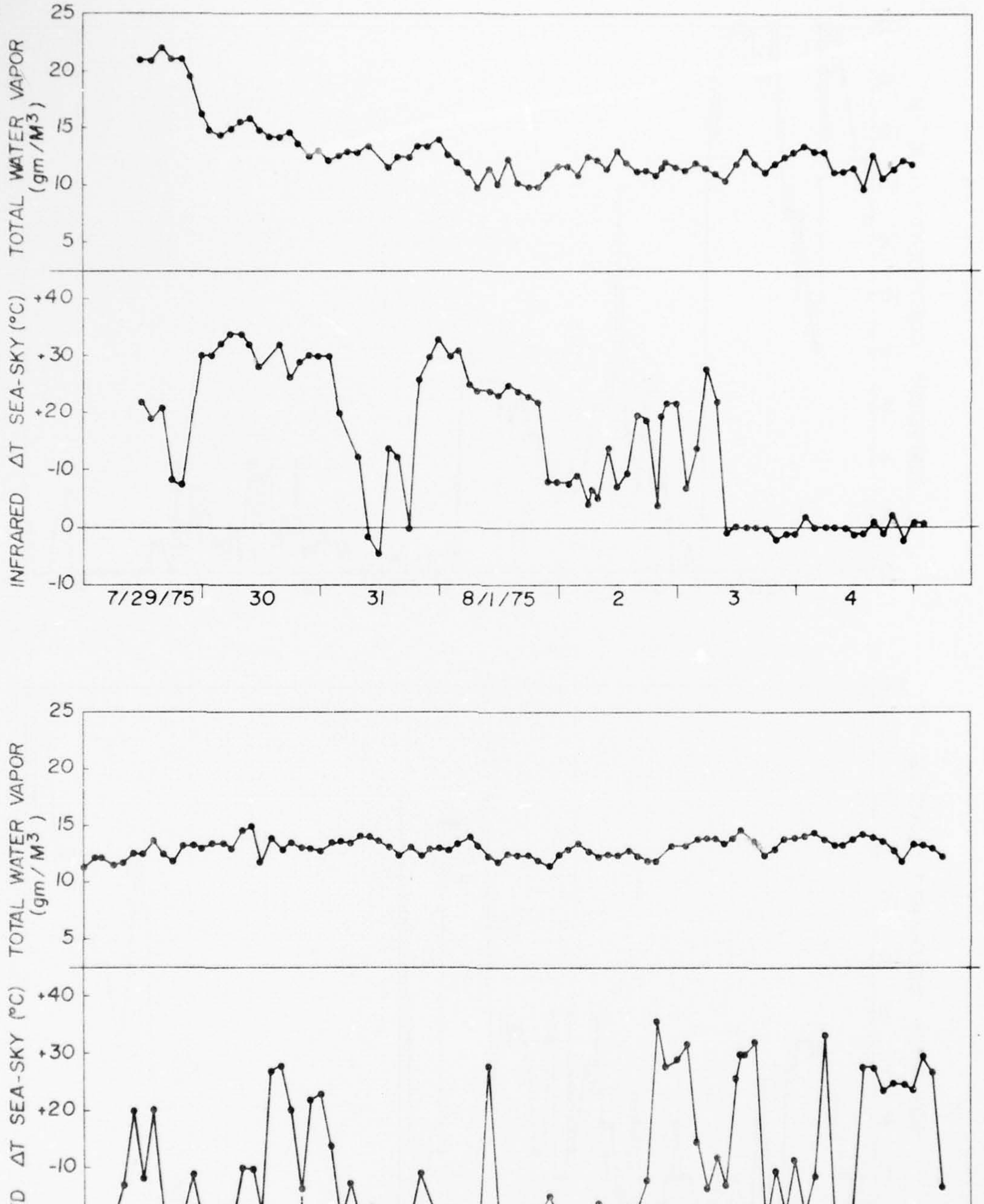
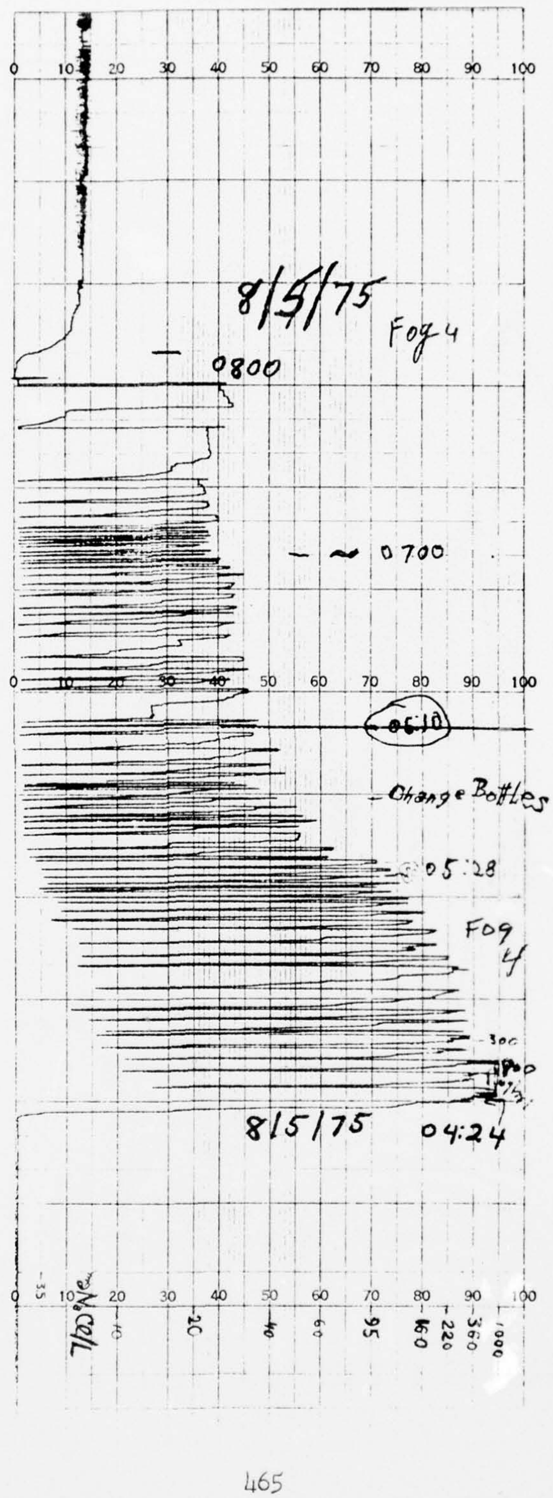
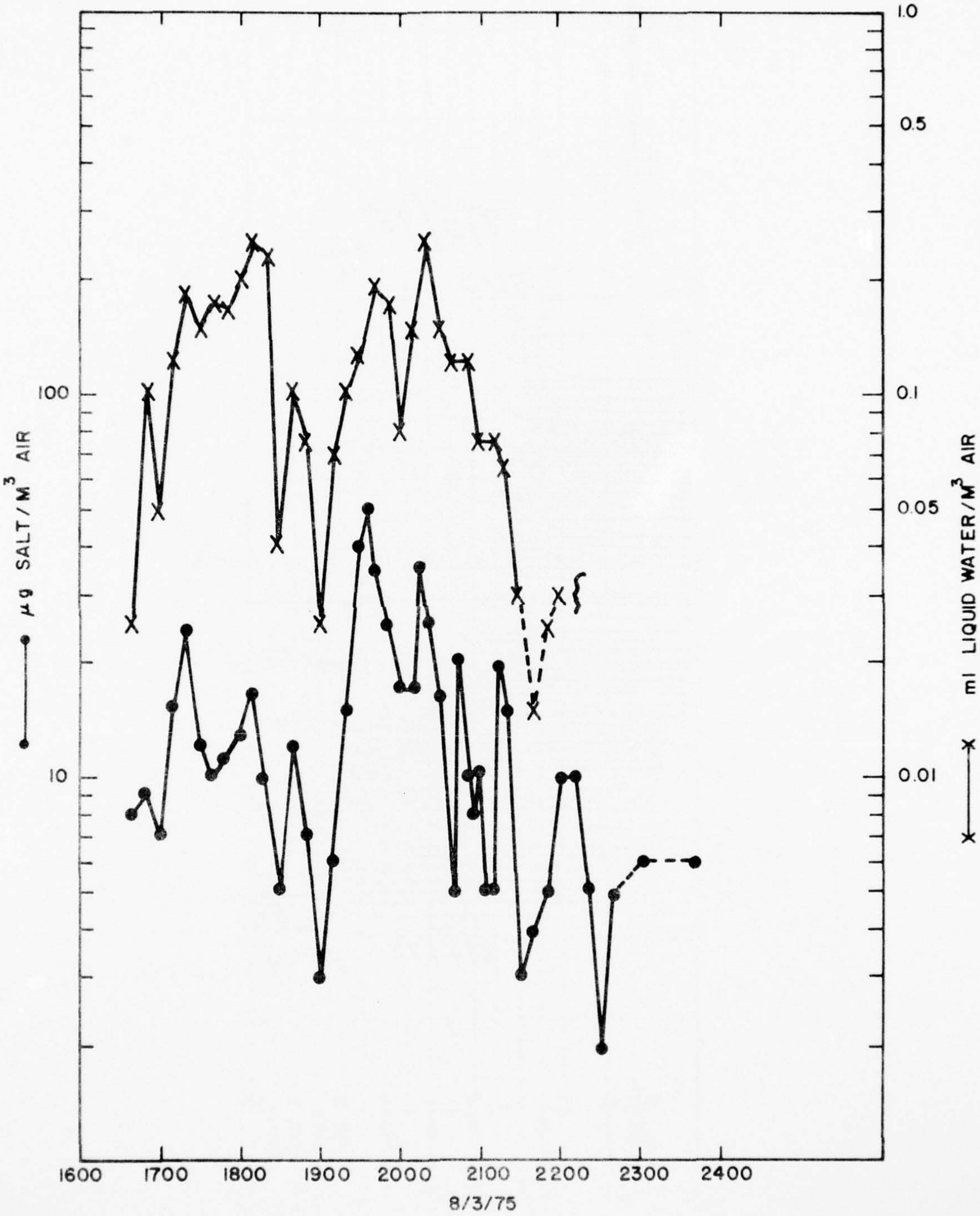
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
7/29/75
30
31
8/1/75
2
3
4

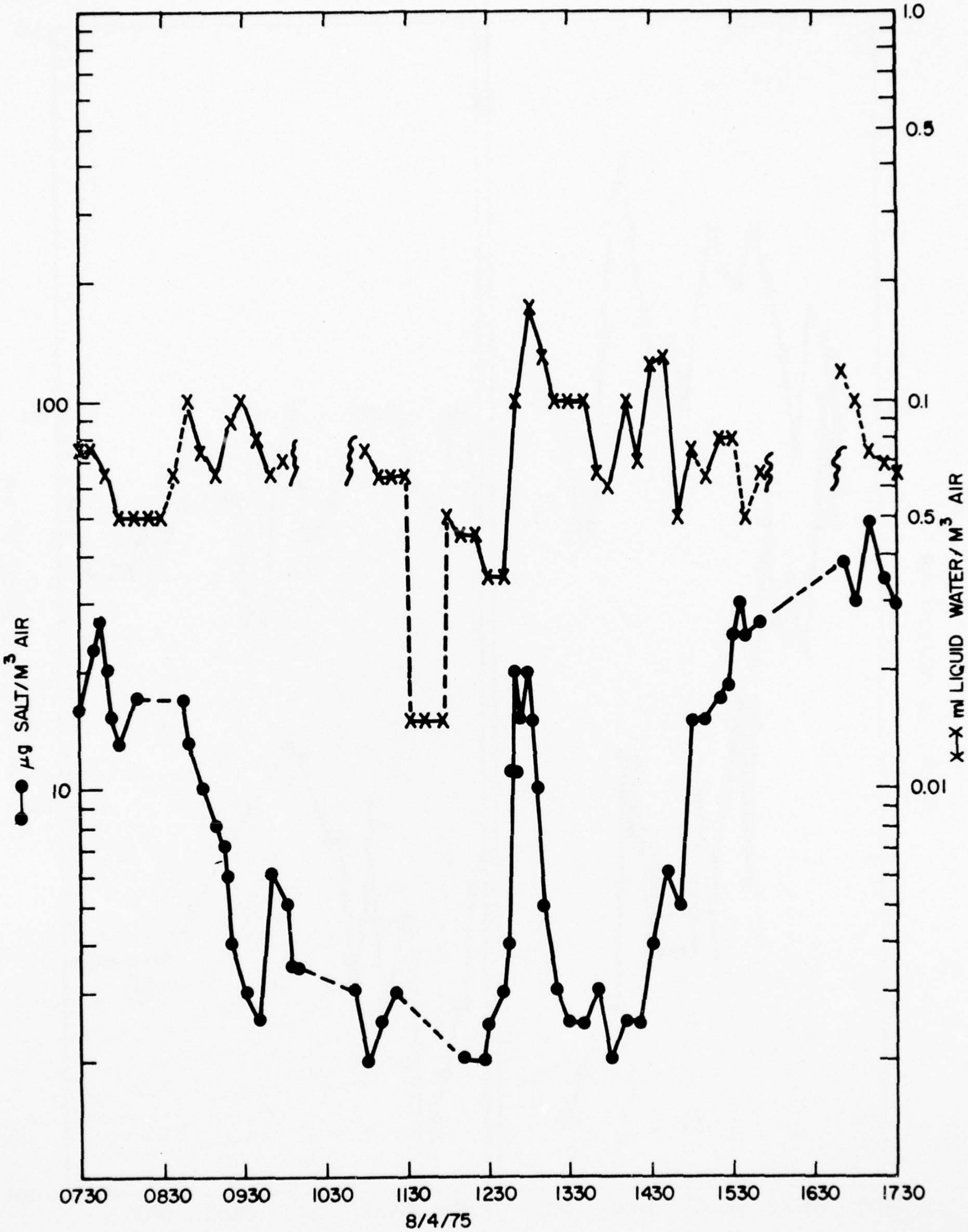

SCATTERING COEFFICIENT (X) x 10^{-4}/M
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
8/5/75
6
7
8
9
10
11


TOTAL WATER VAPOR (gm/M³)
INFRARED ΔT SEA-SKY (°C)
25
20
15
10
5
+40
+30
+20
-10
0
-10
7/29/75
30
31
8/1/75
2
3
4
8/5/75
6
7
8
9
10
11
12


0 10 20 30 40 50 60 70 80 90 100
8/5/75
Fog 4
0800
0700
0 10 20 30 40 50 60 70 80 90 100
06:10
Change Bottles
05:28
Fog 4
8/5/75
04:24
0 10 20 30 40 50 60 70 80 90 100
-35 -10 -20 -40 -60 -95 -160 -220 -360 -1000



1.0
0.5
100
0.1
0.05
10
0.01
1600
1700
1800
1900
2000
2100
2200
2300
2400
8/3/75
μg SALT / M³ AIR
ml LIQUID WATER / M³ AIR



1.0
0.5
100
0.1
0.5
10
0.01
μg SALT/M³ AIR
X—X ml LIQUID WATER/M³ AIR
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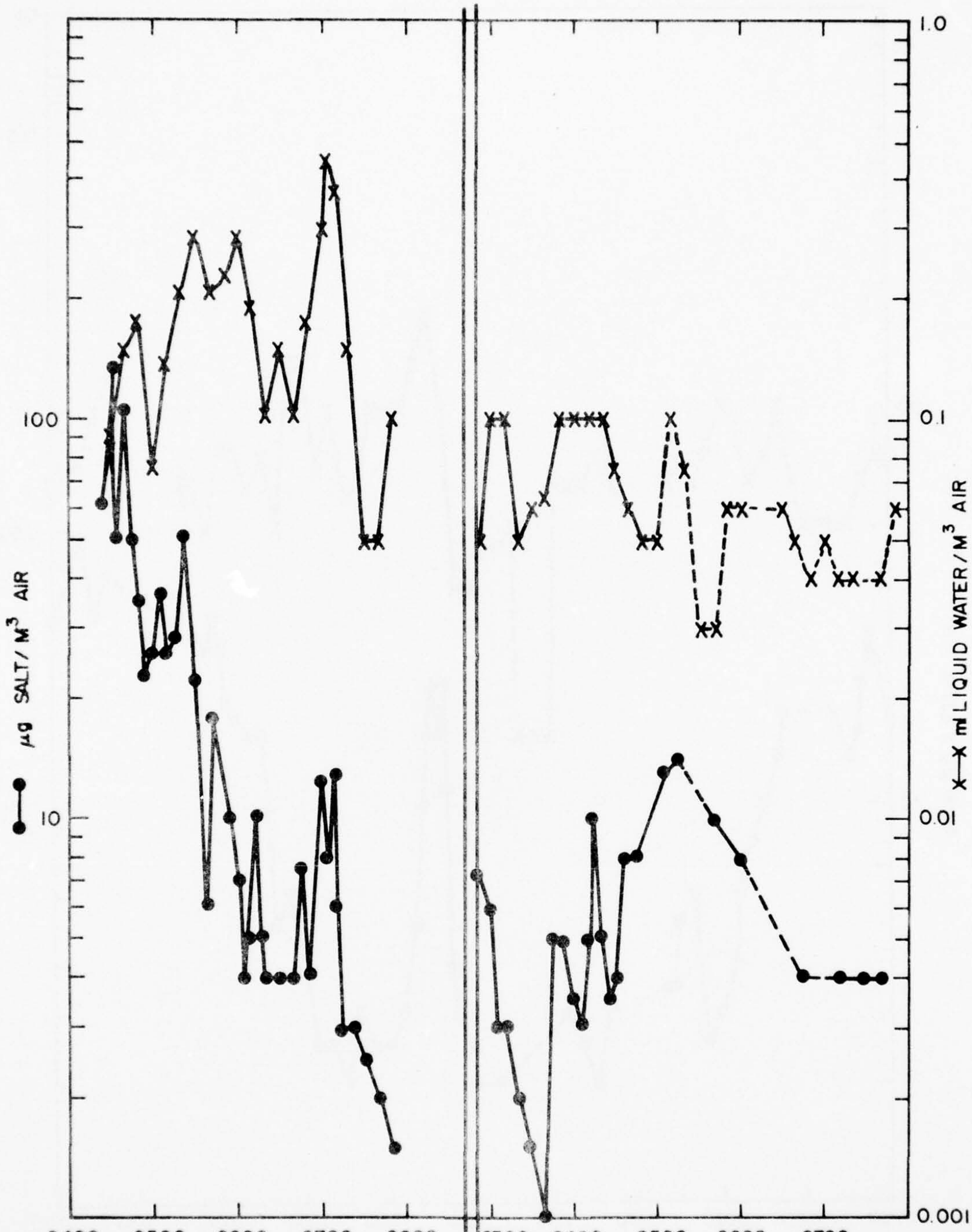
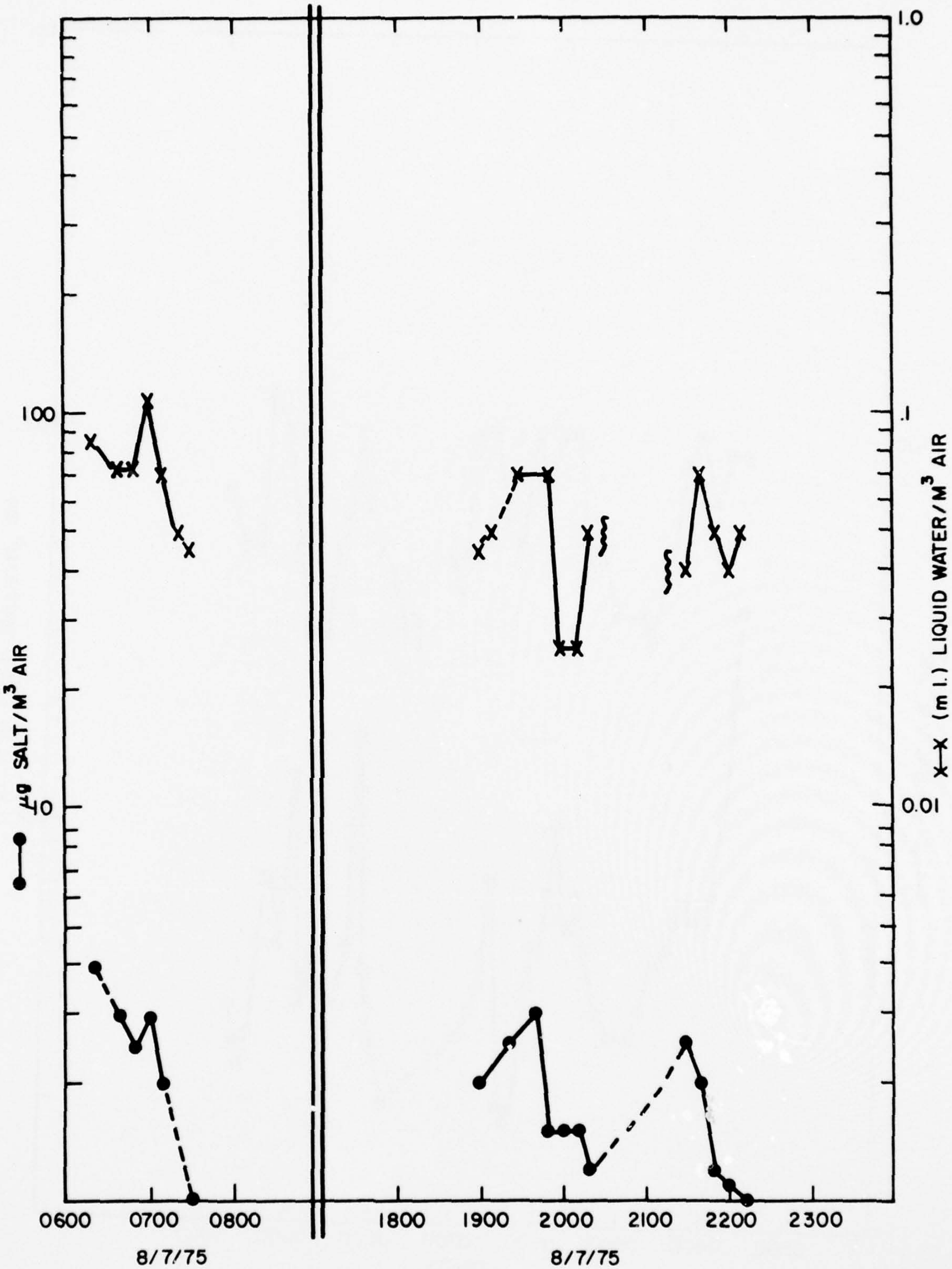
0830
0930
1030
1130
1230
1330
1430
1530
1630
1730
8/4/75



μg SALT / M³ AIR
ml LIQUID WATER / M³ AIR
100
10
1.0
0.1
0.01
0.001
0400
0500
0600
0700
0800
0300
0400
0500
0600
0700
8/5/75
8/6/75


1.0
100
.1
10
0.01
μg SALT/M³ AIR
x—x (ml.) LIQUID WATER/M³ AIR
0600
0700
0800
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2200
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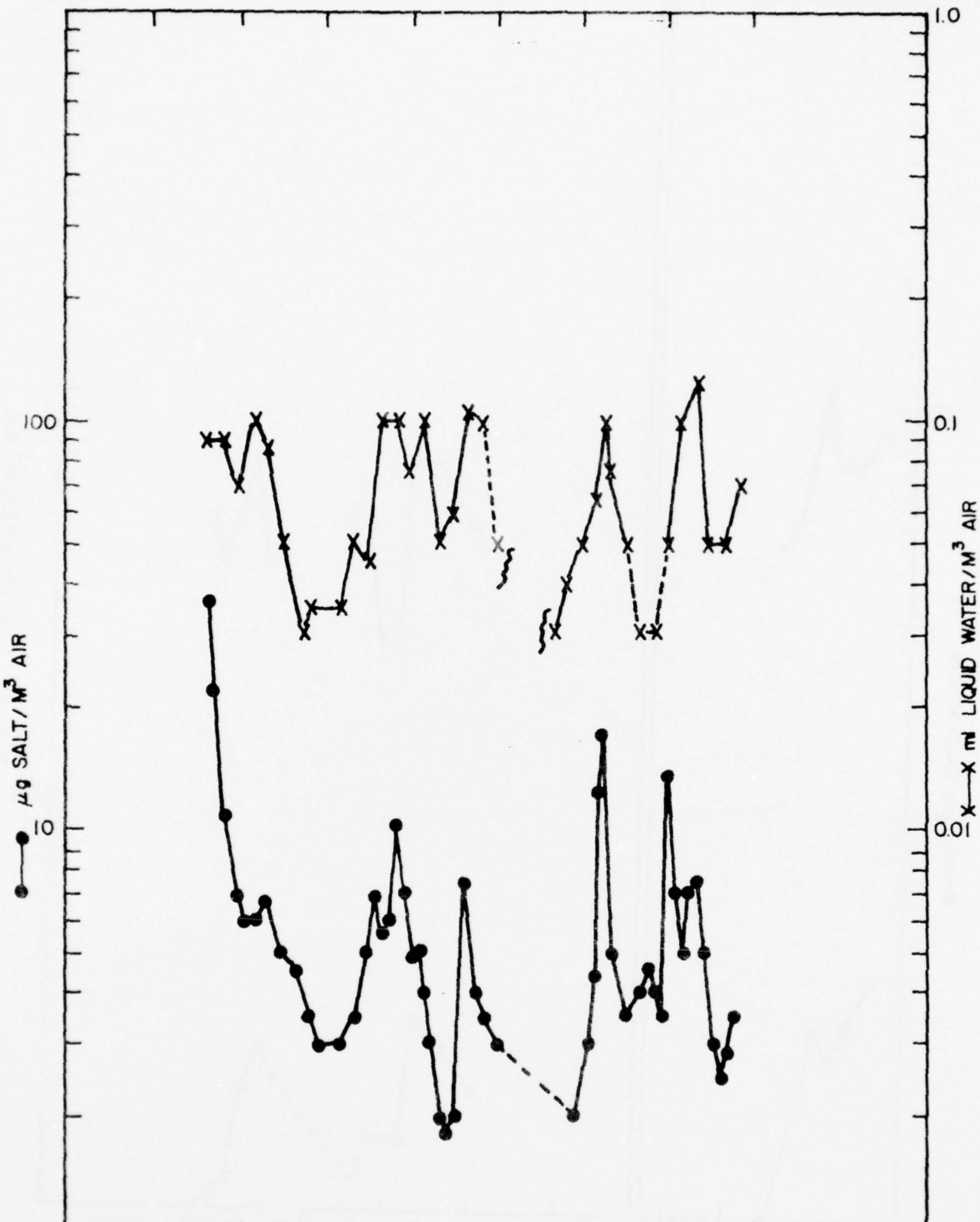
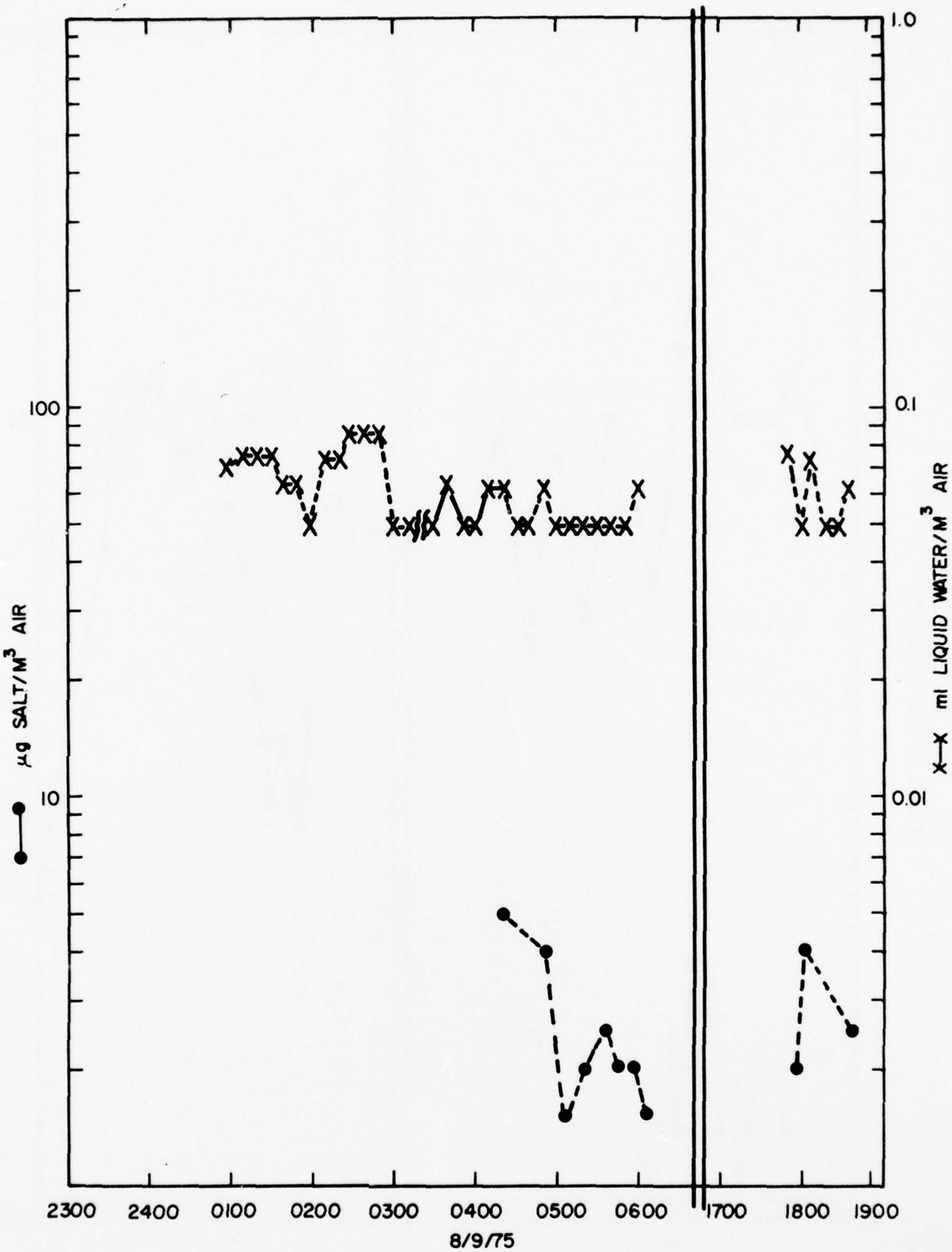
8/7/75
8/7/75


1.0
100
0.1
10
0.01
μg SALT/M³ AIR
ml LIQUID WATER/M³ AIR
0300
0400
0500
0600
0700
0800
0900
1000
8/8/75



1.0
100
0.1
10
0.01
μg SALT/M³ AIR
ml LIQUID WATER/M³ AIR
2300
2400
0100
0200
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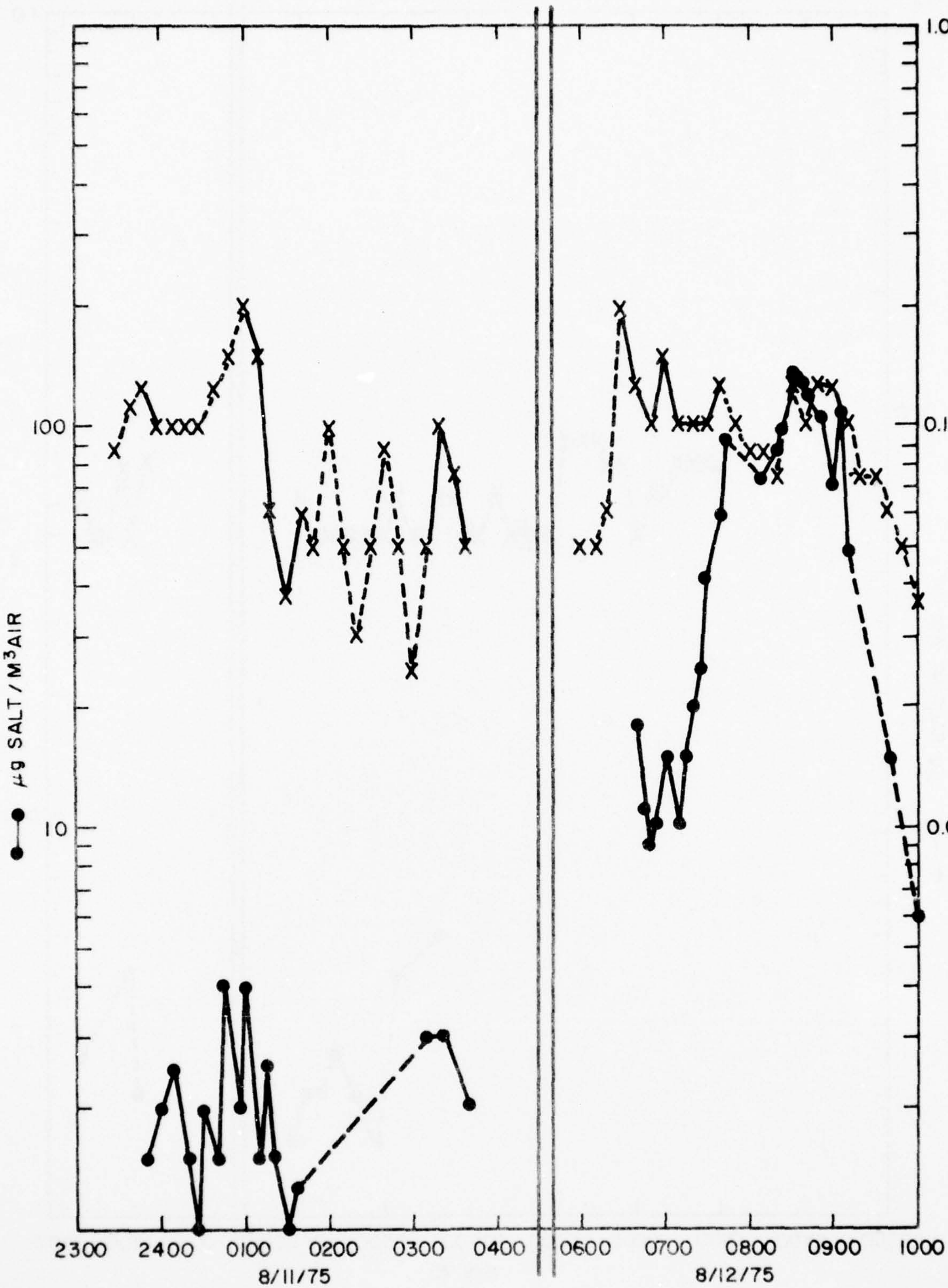
0400
0500
0600
1700
1800
1900
8/9/75



100
10
μg SALT / M³AIR
1.0
0.1
0.01
ml LIQUID WATER / M³ AIR
2300
2400
0100
0200
0300
0400
0600
0700
0800
0900
1000
8/11/75
8/12/75

FOG WATER DATA

Sample	Date	Time	Est. NaCl by -1 mg/L	Na Est. by -1 mg/L	Na found A.A.S. mg/L	A.A.S. Na % of Est. %
1	8/3/75	1600-1800	140	55	38	69
2	8/3/75	1800-2000	210	83	58	70
3	8/3/75	2000-2100	180	72	48	68
4	8/4/75	0800-1400	165	65	48	74
5	8/4/75	1400-1430	115	45	27	60
6	8/5/75	0400-0540	440	173	113	65
7	8/5/75	0540-0740	62	24	6.4	26
8	8/6/75	0130-0715	120	47	8.1	17
9	8/6/75	0715-1200	120	47	6.4	14
10	8/7/75	0410-0730	85	33	3.5	10
11	8/7/75	1800-2200	125	49	9.1	19
12	8/8/75	0615-1030	88	35	4.3	12
13	8/9/75	0000-0550	69	27	8.6	32
14	8/9/75	1730-1830	45	18	5.8	32
15	8/10-11/75	2230-0330	37	15	2.2	15
16	8/3/75	1615-1745	180	71	36.1	51
17	8/3/75	1900-2000	225	90	70	78
18	8/4/75	0800-0919	285	112	84.2	75
19	8/4/75	1200-1400	580	228	206	90
20	8/5/75	0600-0700	38	15	1.2	8
21	8/6/75	0130-0330	100	39	22.1	56
22	8/9-11/75		135	53	19.7	37
Seawater			35,000	14,000	10,600	76

FOG WATER DATA

Sample	Date	Time	K found A.A.S. mg/L	Na/K mg/mg	Cl⁻ Hg or *Ag titration mg/L ± .5 *± 4	Cl⁻/Na mg/mg
1	8/3/75	1600-1800	2.7	14.1	63 ± 1	1.7
2	8/3/75	1800-2000	4.8	12.0	*92.3	1.6
3	8/3/75	2000-2100	4.7	10.2	*79	1.65
4	8/4/75	0800-1400	4.7	10.2	*76.5	1.6
5	8/4/75	1400-1430	2.1	12.7	54.5 ± 1	2.0
6	8/5/75	0400-0540	5.9	19.0	*180	1.6
7	8/5/75	0540-0740	0.24	26.3	11.3	1.8
8	8/6/75	0130-0715	0.45	17.9	15.6	1.9
9	8/6/75	0715-1200	0.37	17.2	12.5	1.9
10	8/7/75	0410-0730	0.17	20.4	5.0	1.4
11	8/7/75	1800-2200	0.55	16.6	13.3	1.45
12	8/8/75	0615-1030	0.15	28.6	6.1	1.4
13	8/9/75	0000-0550	0.45	19.2	12.9	3.6
14	8/9/75	1730-1830	0.27	21.3	11.6	2.0
15	8/10-11/75	2230-0330	0.07	31.5	3.6	1.6
16	8/3/75	1615-1745	2.1	17.2	55.7	1.55
17	8/3/75	1900-2000	3.8	18.4	*113	1.6
18	8/4/75	0800-0910	4.7	17.9	*127	1.5
19	8/4/75	1200-1400	8.8	23.4	*337	1.65
20	8/5/75	0600-0700	.02-.01	60-30	3.1 ± 2	2.5
21	8/6/75	0130-0330	1.2	17.9	41	1.85
22	8/9-11/75		1.1	17.9	36	1.8
Seawater			380	28	*19,000	1.79

FOG WATER DATA

Sample	Date	Time	$SO_4^=$/ Ba. Turbid. mg/L ± 2	$SO_4^=$/ Na mg/mg	pH
1	8/3/75	1600-1800	24	.64	3.8
2	8/3/75	1800-2000	23	.40	4.0
3	8/3/75	2000-2100	19	.40	4.0
4	8/4/75	0800-1400	18	.37	3.4
5	8/4/75	1400-1430	13.5	.50	5.0
6	8/5/75	0400-0540	61	.53	3.6
7	8/5/75	0540-0740	15	2.3	3.5
8	8/6/75	0130-0715	25	3.2	3.1
9	8/6/75	0715-1200	32	4.9	3.0
10	8/7/75	0410-0730	17	4.7	3.2
11	8/7/75	1800-2200	29	3.3	3.1
12	8/8/75	0615-1030	13	3.1	3.2
13	8/9/75	0000-0550	14	1.6	3.8
14	8/9/75	1730-1830	14	2.3	3.5
15	8/10-11/75	2230-0330	7.5	3.4	3.7
16	8/3/75	1615-1745	22	.64	6.9
17	8/3/75	1900-2000	26	.40	6.7
18	8/4/75	0800-0910	21	.26	6.7
19	8/4/75	1200-1400	52	.25	6.7
20	8/5/75	0600-0700	7	5.4	3.7
21	8/6/75	0130-0330	12	.54	4.7
22	8/9-11/75		19	.95	3.7
Seawater			2,650	.25	8.1

Scanning Electron Microscopic and Energy Dispersive X-Ray Analysis of Ambient Atmospheric Aerosols, Sea Fog Residues, and Related Samples Collected During the USNS Hayes Cruise off the Coast of Nova Scotia, Canada
29 July - 12 August 1975

C.K. Akers, E.A. Gasiecki and R.E. Baier
Calspan Corporation

PREFACE

The primary purpose of this data report is to illustrate the value of scanning electron microscopy and energy-dispersive x-ray analysis in determining important features of meteorologic specimens. All the data reported here were obtained in the laboratory, using samples acquired during the 1975 fog cruise of USNS Hayes. It should be particularly noted that the fog water residues which are characterized herein were derived from water specimens which had been stored for nearly a year, and that any material which precipitated from the bulk water phase during storage is not represented in the x-ray spectra reproduced here. The analytical results are presented with minimal interpretation and discussion, to allow objective study by other participants in the August 1975 cruise of the USNS Hayes.

Section 1: BUBBLE BURSTING EXPERIMENTS

1.1 Introduction

On the sea fog trip of the USNS Hayes, sea water was collected on 11 August 1975 at 1343 GMT. The sea water sample was placed in Duncan Blanchard's bubble aging chamber. Two experiments were performed. The first experiment aged the air bubble for 1.2 seconds. This was accomplished by having no countercurrent in the chamber. The second experiment aged the air bubble for 30 seconds in the chamber.

1.2 Methods

The jet drops were collected on aluminum foil attached to a glass slide support. The aluminum foil with the collected jet drops was air dried on board ship, wrapped in tissue, sealed in plastic boxes, and returned to Calspan for examination.

Samples of dried jet drops were examined by energy dispersive x-ray analysis for atomic composition and photographed with an ETEC Scanning Electron Microscope.

The jet drops were easily recognized by their characteristic appearance. The SEM appearance of the dried jet drops on the aluminum foil consisted of one or two large crystals and several smaller crystals inside a darkened area (see Fig. 1).

Energy-dispersive x-ray elemental analysis was performed on the large crystal and the background area around the large crystal which contained the smaller crystallites. The energy-dispersive x-ray analysis will only detect elements with atomic number greater than 11 (sodium). Therefore, oxides and nitrates cannot be identified.

1.3 Results and Discussion

Table I presents the molecular analysis of the jet drop components as developed from energy-dispersive x-ray analysis.

From surface chemistry principles, it is expected that humic acid fractions dissolved or suspended within the sea will immediately concentrate at the air-liquid interface as soon as an air bubble is formed. Due to the surface-free energy available at the interface, the adsorbed humic acid (or protein) will probably denature. This denaturing event takes a few seconds to occur. A possible explanation of the results of the Blanchard bubble chamber experiments is that after 1.2 seconds of aging, the humic acid has not denatured; therefore, the inorganic ions that are carried with the jet drops are those associated with the humic acid in its native configuration. However, when the air bubble is aged for 30 seconds, the humic acid is partially denatured. The denatured humic acid, during its configurational change, will release its adsorbed cations and counterions. The ions which then, secondarily, adsorb to the denatured humic acid will be different. In this specific experiment, the native humic acid carried primarily calcium and potassium cations and sulfate as the predominant anion. The 'denatured' humic acid carried primarily sodium chloride with small amounts of calcium, potassium, and the sulfate anion (Table I).

The phenomenon of transporting molecules and particles from the sea to the air through bubble bursting has been under study by many investigators. However, the differentiation of inorganic ions in jet drops as a function of the time that an air bubble is in the sea has not been investigated hitherto.

Section 2: AEROSOL SAMPLES

Aerosol samples for laboratory analysis were collected from 5 August to 11 August 1975 on board the USNS Hayes using the "Bressan Impactor". Each sample will be discussed separately.

2.1 Samples on Germanium Prisms

2.1.1 5 August 1975--The Bressan Impactor was used to collect aerosol samples on a germanium prism from 2240 to 2340 hours, just prior to encountering Fog 7. The visibility went from > 6,000 meters to 4500 meters. Figures 2a and 2b illustrate the particles collected and the elemental analysis. The elemental composition determined by energy-dispersive x-ray analysis consisted of Fe, S (presumable SO_4), and Si.

2.1.2 6 August 1975--The sample was impacted on a germanium prism from 1700 to 1800 hours. The visibility was greater than 6000 meters. There was a bright sun shining through a thin overcast, and calm seas. The sample contained Si, Al, Fe, K, Ca, and SO_4 (Fig. 3). The sample contained irregular particles as well as some diatoms.

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MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)
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2.1.3 7 August 1975--The specimen was collected on a germanium prism from 1525 to 1600 hours. The visibility went from 800 meters to 200 meters during this period, as Fog 10 was penetrated. Not very many particles remained, most having been lost by washing with the fog water. The particles contained Mg, Si, Fe, and S (presumably SO_4). See Figs. 4a and 4b.

2.1.4 9 August 1975--A sample was collected overnight from 9 August to 10 August 1975, between encounters with Fog 12 and Fog 13, on a germanium prism. The prism was then leached free of soluble salts with distilled water. The evening was clear.

The SEM analysis showed only round particles from 0.5 to 1.0 μ diameter, remaining after distilled water leaching. The elemental analysis indicated only a trace amount of sulfur present. The particles are probably carboniferous material (see Figures 5a and 5b).

2.2 Samples on Glass Slides

The following aerosol samples were collected on glass microscope slides. The elemental composition of glass includes many of the same elements that were found in the aerosol samples obtained on germanium prisms. Therefore, energy dispersive x-ray analysis was not always successful with the glass substrate aerosol samples, since unambiguous results could not be obtained unless the glass slides were heavily coated with aerosol particles.

2.2.1 7 August 1975--The sample was taken from 1210 to 1300 hours. The visibility was approximately 4000 meters with an overcast sky. The sample contained several particles as shown in Figure 6.

2.2.2 8 August 1975--The sample was taken from 2240 to 2330 hours. The visibility was greater than 6000 meters with clear skies at 2240. However, by 2330 hours, the USNS Hayes was within Fog 11. There were only some sparse particles remaining after "washing" of the impacted aerosol by the fog water (see Figure 7).

2.2.3 9 August 1975 (A)--The sample was taken from 1600 to 1700 hours, just prior to Fog 12. The visibility was greater than 6000 meters. The sky had a dense stratus overcast.

The particles on the glass substrate formed rings with several more particles inside the rings. This indicates that the original sample impacted on the glass substrate was in a water droplet form (see Figure 8).

2.2.4 9 August 1975 (B)--The sample was taken from 1735 to 2000 hours within Fog 12. The sky consisted of broken clouds with some sun. The USNS Hayes was going in and out of fog patches during the sampling time. There were very few particles collected in this run (see Figure 9).

2.2.5 11 August 1975 (A)--The sample was taken from 1450 to 1700 hours. The visibility went from 4000 meters to greater than 6000 meters during this period, just exiting Fog 15.

The sample obtained was loaded with particulate material. The x-ray elemental analysis indicated the presence of Na, Mg, Ca, K, Cl, and S (presumably SO_4). See Figure 10.

2.2.6 11 August 1975 (B)--The sample was taken from 1755 to 2030 hours. The visibility was greater than 6000 meters. However, coastal fog was forming on the horizon. The sample was taken as the USNS Hayes approached Halifax, Nova Scotia, Canada.

The sample was loaded with particles (Figure 11). There was also evidence of diatoms within the sample. The x-ray analysis also indicated the presence of aluminum in the sample, probably from continental dust.

2.2.7 11 August 1975 (C)--The sample was taken from 2010 to 2310 hours. The visibility went from 4500 meters to 3000 meters during this period. There was a clear starlit sky with a near surface haze; the sea was calm.

The sample contained a considerable amount of material. There was evidence of some diatomaceous remnants. The x-ray analysis clearly indicated the presence of aluminum, reflecting the approach of the USNS Hayes to Halifax, Nova Scotia. See Figure 12.

2.3 Discussion of General Observations

All the aerosol samples contained some particles. Samples that were taken in fog showed the least number of particles. This is presumably due to the fog water washing the particulates off the glass substrate used in the Bressan Impactor. As the aerosol samples were taken closer to land, the concentration of particles increased dramatically. The "near-land" samples also contained aluminum and diatoms.

Section 3: ANALYSIS OF SEA FOG RESIDUES

3.1 Energy-Dispersive X-Ray Studies

Known volumes of collected sea fogs were evaporated to dryness on carbon-silicon planchettes for subsequent analysis using the Energy-Dispersive X-Ray Analyzer in conjunction with a Scanning Electron Microscope (SEM). The X-Ray Analyzer collects X-Ray photons emitted as one interaction of an electron beam with a specimen. The following spectra are semi-quantitative analyses of the matter originally dissolved or suspended in the sea fog. Using this technique, recall that the analysis detects elements heavier than and including sodium. The efficiency of collection, however, is not linear as one moves across the periodic table; and as a result, the relative concentrations indicated by varying peak heights on the following spectra are only approximate. Figure 13 characterizes the substrate "blank" and provides comparison spectra for seawater residues and residues from inland fog water. Figures 14, 15, and 16 characterize the dried residues from North Atlantic fog water samples.

The conditions of the analysis were as follows:

- Magnification - 30 X
- Accelerating Potential - 20 kV
- Counting Time - 100 seconds
- Specimen Tilt - 45^{o}
- Working Distance - 16 mm
- Beam Current - approximately 0.55×10^{-10}

3.2 Fog Water Precipitates

Even while at sea, it was observed that as the fog water samples were allowed to stand in sealed containers, flocculant precipitates would form. The precipitates were gelatinous in nature. Samples of the fog water precipitate were collected on a germanium prism for immediate analysis as reported elsewhere, and then the precipitates were transferred to glass slides. All samples were leached with distilled water prior to this transfer.

3.2.1 3 August 1975--The fog water sample was collected by NRL from 1615 to 1745 hours in Fog 4A. The precipitated material that was transferred to glass slides showed irregular particles (Figure 17). The x-ray analysis indicated the presence of aluminum and iron, as well as the elemental spectrum of the glass substrate.

3.2.2 6 August 1975--The sample of fog water was taken by NRL from 0130 to 0330 hours on 6 August. The sediment contained a large amount of material of irregular shape (Figure 18). The particulate matter was not single crystals but amorphorous in form. The x-ray analysis showed the presence of aluminum and iron as well as the elements found in glass.

TABLE I. MOLECULAR ANALYSIS DETERMINED BY ENERGY DISPERSIVE X-RAY ELEMENTAL ANALYSIS

INDIVIDUAL JET DROP ANALYSIS		
SAMPLE	LARGE CRYSTAL	BACKGROUND
1.2 Sec AGED JET DROPS	1. $CaSO_4 > K_2SO_4$	1. $K_2SO_4 > CaSO_4$
	2. NaCl	2. K ≈ Ca; Cl > S
	3. $K_2SO_4 > CaSO_4$	3. K > Ca; $SO_4 \sim Cl$
	4. $CaSO_4 > K_2SO_4$ (TRACE Mg)	4. $K_2SO_4 > CaSO_4$
30 Sec AGED JET DROPS	1. NaCl	1. $MgSO_4 \sim MgCl_2$
	2. $NaCl \gg MgSO_4$	2. $CaSO_4 \sim KCl$
	3. NaCl	3. Ca ≫ Na; Cl ~ S
	4. NaCl	4. NaCl
	5. $NaCl \ggg Na_2SO_4$	5. NON DETECTABLE
	6. NaCl	6. S ~ Cl

TOTAL COMPOSITION		
SAMPLE	CATION	ANION
1.2 Sec AGED TOP JET	Ca, K	SO_4
DROPS	Na, Mg (SMALL AMT's)	Cl (SMALL AMT'S)
30 Sec AGED TOP &	Na	Cl
2ND JET DROPS	Ca, K (SMALL AMT'S)	SO_4 (SMALL AMT'S)

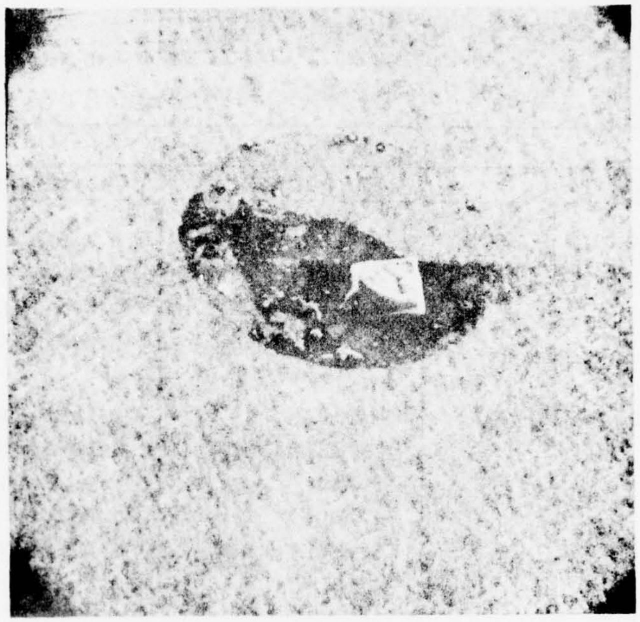


Figure 1 1.2 sec AGED TOP JET DROP, 1043 hr SAMPLE ON 11 AUGUST 1975
45° TILT, 20 Kv, 360x MAG

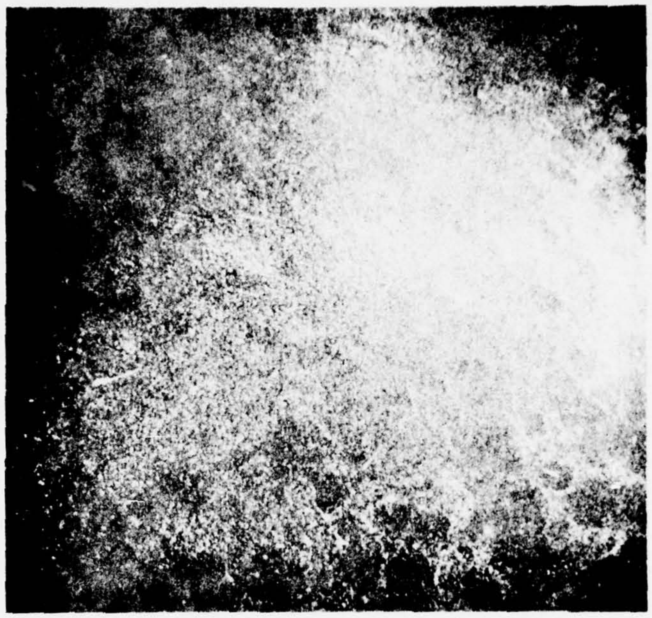


Figure 2a SCANNING ELECTRON MICROSCOPY OF 5 AUG 75 SAMPLE (13 X MAG)

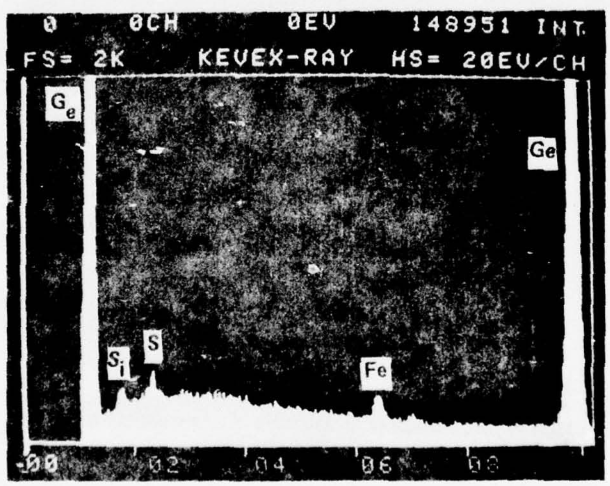


Figure 2b ENERGY DISPERSIVE X-RAY ELEMENTAL ANALYSIS OF 5 AUG 75 SAMPLE

Figure 3a SEM OF SAMPLE 6 AUG 75 (1400 X MAG)

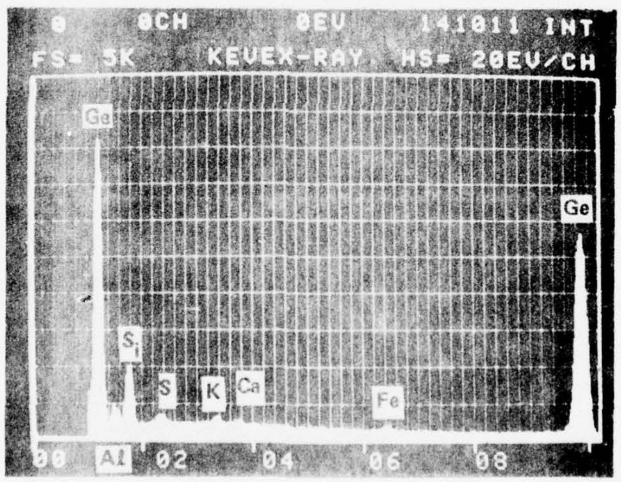


Figure 3b ENERGY-DISPERSIVE X-RAY ANALYSIS

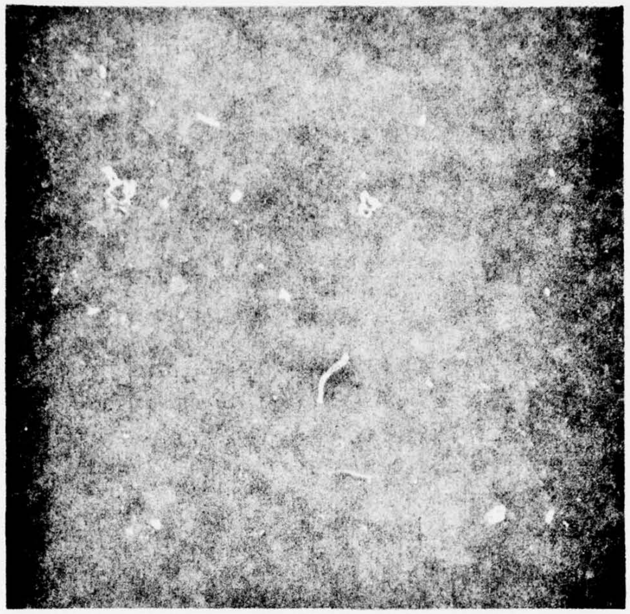


Figure 4a SCANNING ELECTRON MICROSCOPY OF 7 AUG 75 SAMPLE (120X MAG)

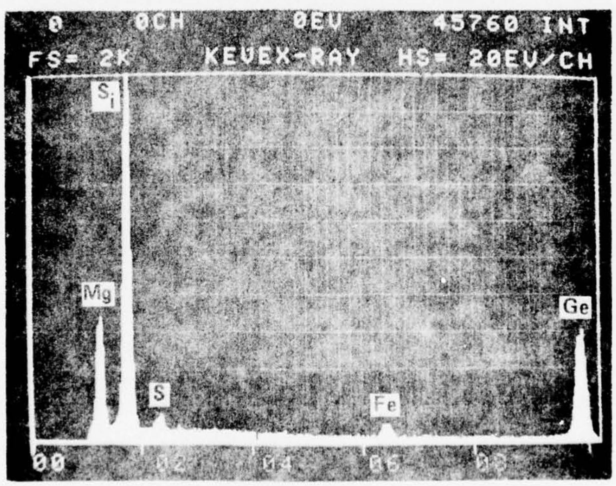


Figure 4b X-RAY ANALYSIS

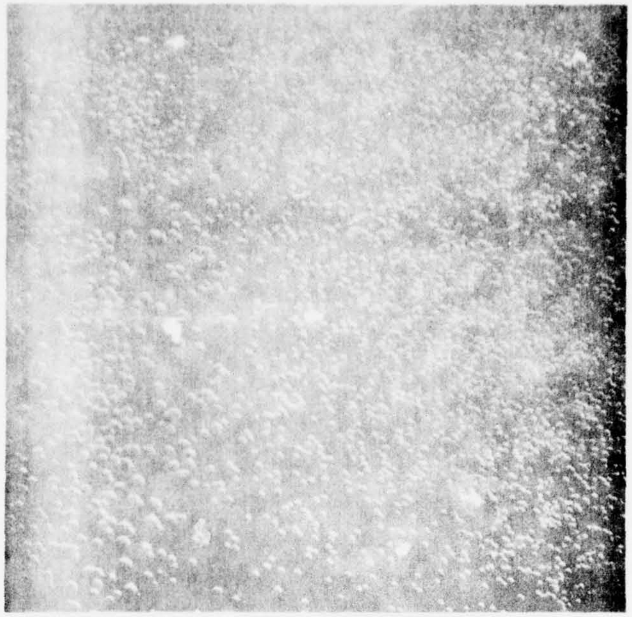


Figure 5a SEM OF DISTILLED H_2O LEACHED 9 AUG 75 SAMPLE
(1300X Mag 45^{o} TILT, 20 kV)

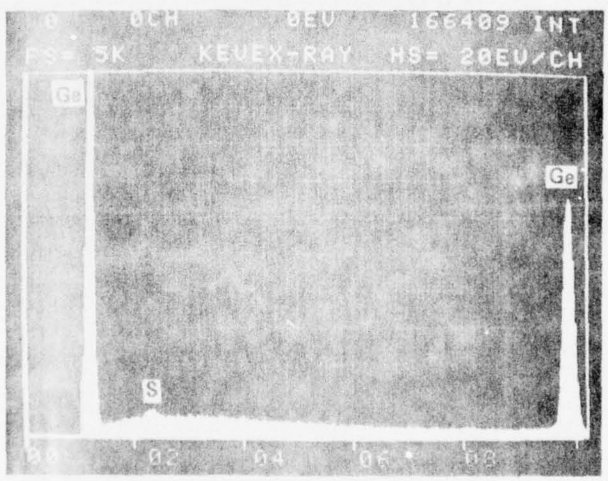


Figure 5b X-RAY ELEMENTAL ANALYSIS (ONLY A TRACE AMOUNT OF SULFUR)

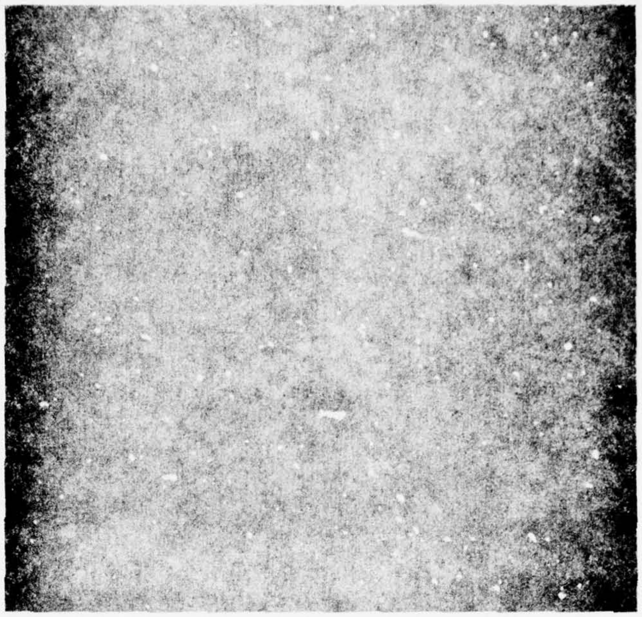


Figure 6 SEM OF 7 AUG 75 SAMPLE (140X MAG, 45° TILT, 20 KV)

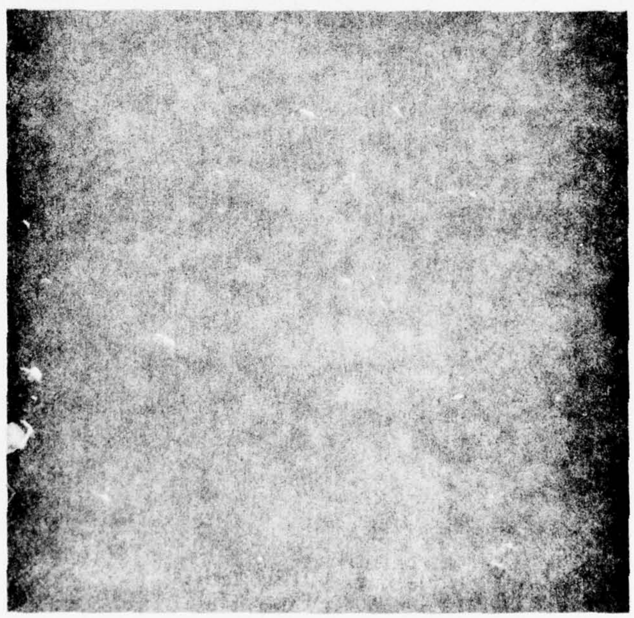


Figure 7 SEM OF 8 AUG 75 SAMPLE (1300X MAG, 45° TILT, 20 KV)

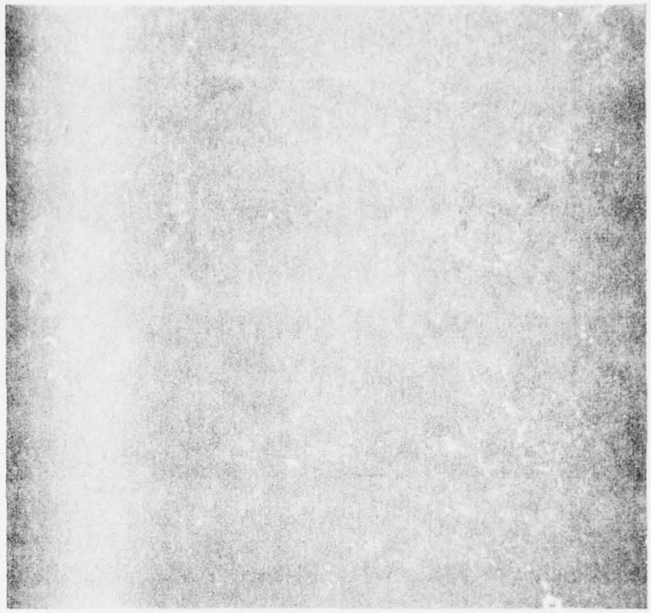


Figure 8 SEM OF 9 AUG 75 (A) SAMPLE (140X MAG, 45° TILT, 20 KV)

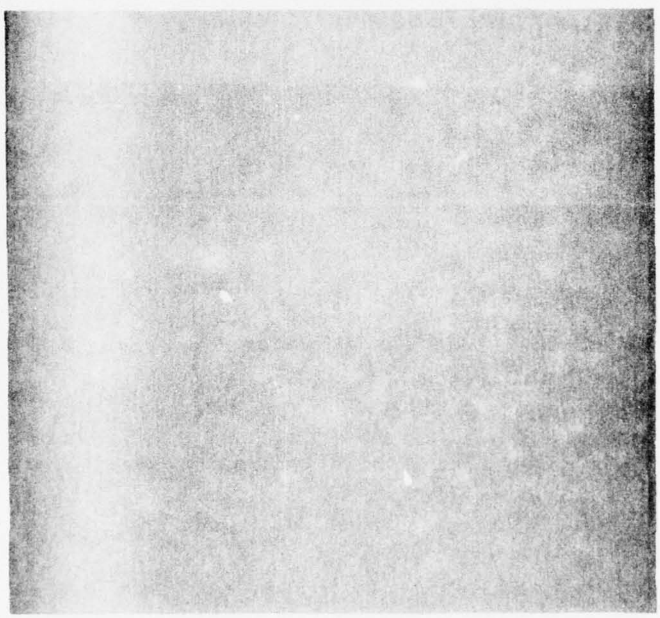


Figure 9 SEM OF 9 AUG 75 (B) SAMPLE (140X MAG, 45° TILT, 20 KV)

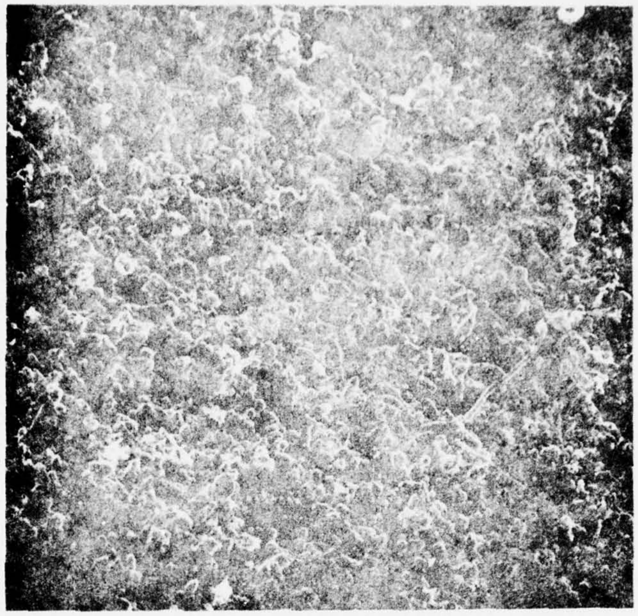


Figure 10 SEM OF 11 AUG 75 (A) SAMPLE (128X MAG, 45^{O} TILT, 20 KV)

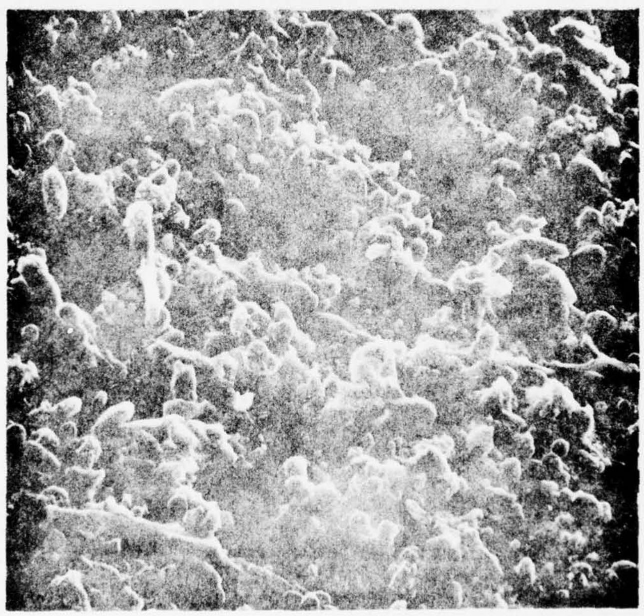


Figure 11 SEM OF 11 AUG 75 (B) SAMPLE (520X MAG, 45^{O} TILT, 20 KV)

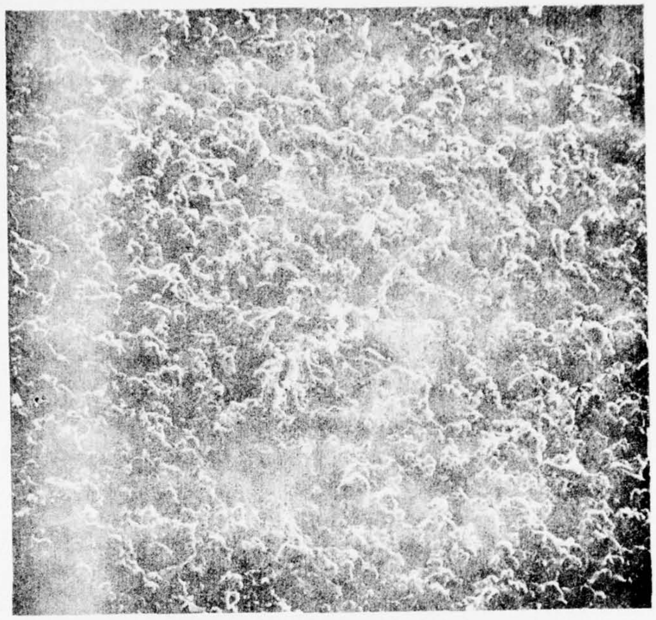
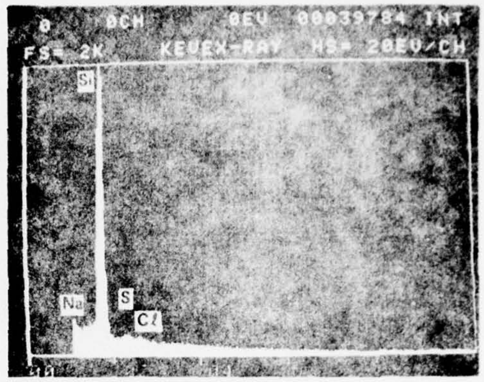
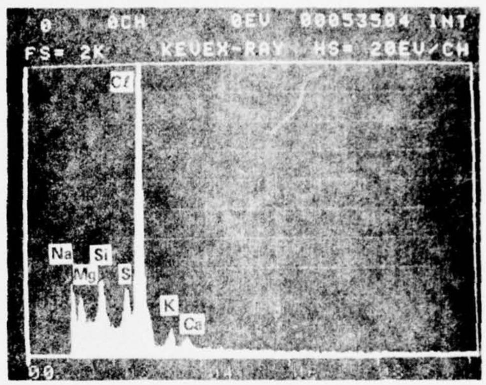


Figure 12 SEM OF 11 AUG 75 (C) (110X MAG, 45° TILT, 20 KV)

BLANK SUBSTRATE



SEA WATER



CALSPAN COMPOSITE-INLAND FOGS-TRAVIS AFB, JAN '73

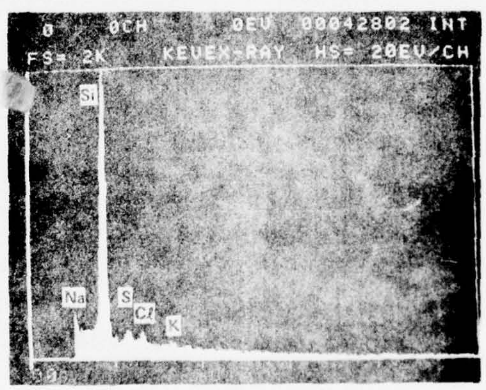
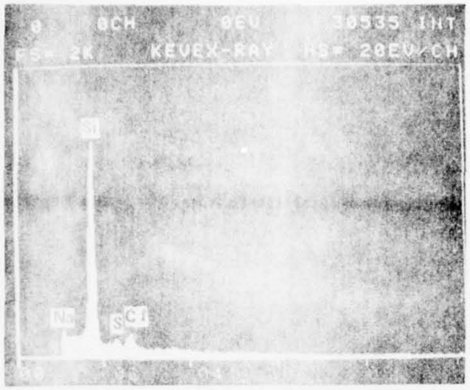


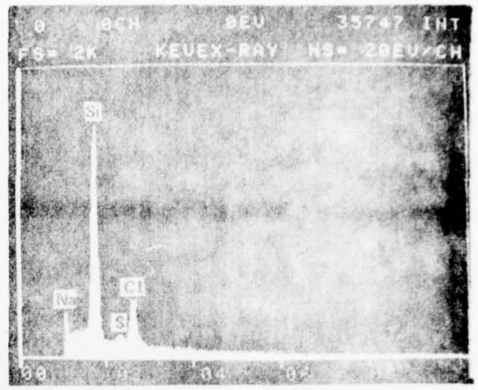
Figure 13 ENERGY-DISPERSIVE X-RAY SPECTRA OF "BLANK" CARBON-SILICON SUBSTRATE, AND OF THAT SAME SUBSTRATE WITH THE DRIED RESIDUES FROM 0.5 mℓ ALIQUOTS OF SEAWATER AND OF INLAND FOG WATER

NRL COMPOSITE 8/3/75 1600-1800



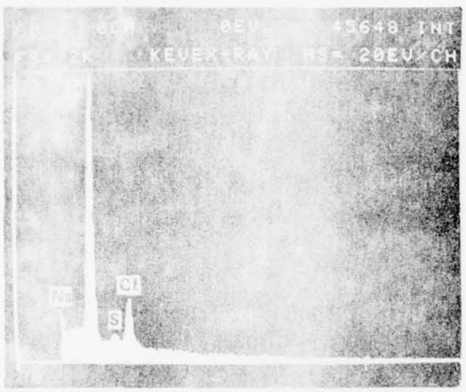
FOG 4A (DISSIPTATING EDGE)

NRL COMPOSITE 8/3/75 1800-2000



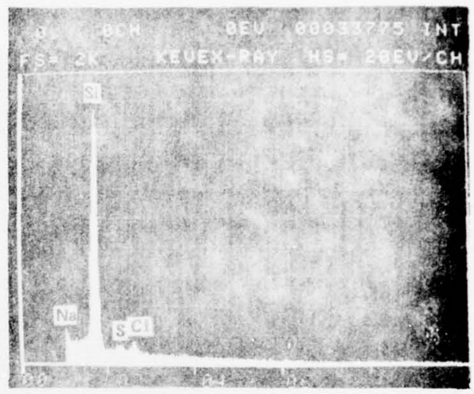
FOG 4A (CENTER)

NRL COMPOSITE 8/3/75 2000-2100

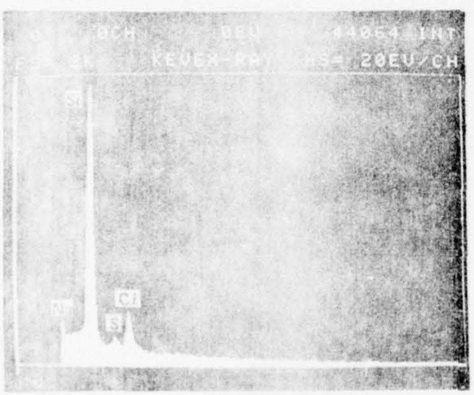


FOG 4A (FORMING EDGE)

CALSPAN COMPOSITE FOGS 4C-B 3-4 AUG 75

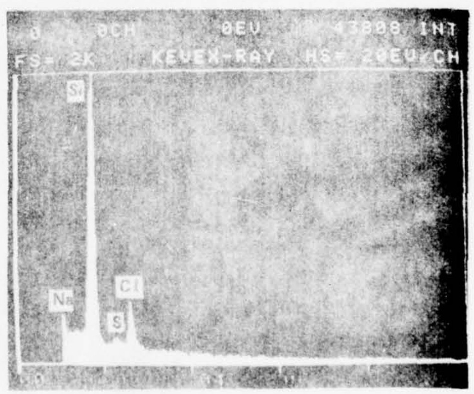


NRL COMPOSITE 8/4/75 0800-1400



FOG 4C

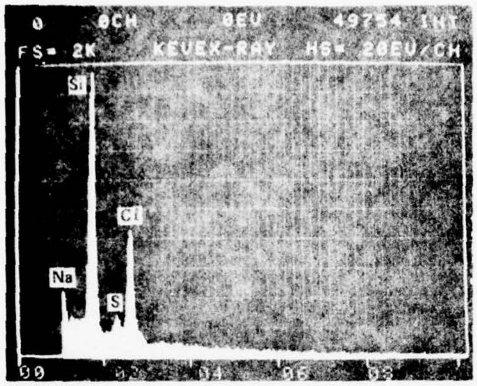
NRL COMPOSITE 8/4/75 1400-1430



FOG 4C

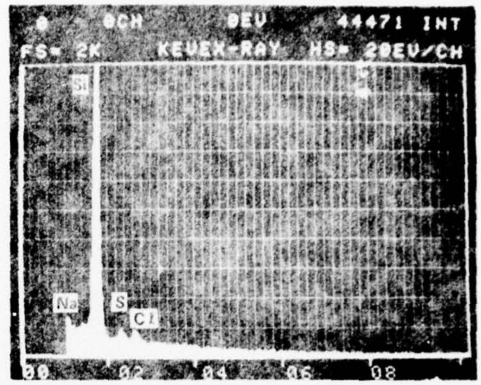
Figure 14 ENERGY DISPERSIVE X-RAY SPECTRA OF DRIED RESIDUES FROM 0.5 mℓ ALIQUOTS OF NORTH ATLANTIC FOG WATER ON A CARBON-SILICON SUBSTRATE. FOGS OF 3 AUG – 4 AUG 75 OFF THE COAST OF NOVA SCOTIA, CANADA

NRL COMPOSITE 8/5/75 0400-0540



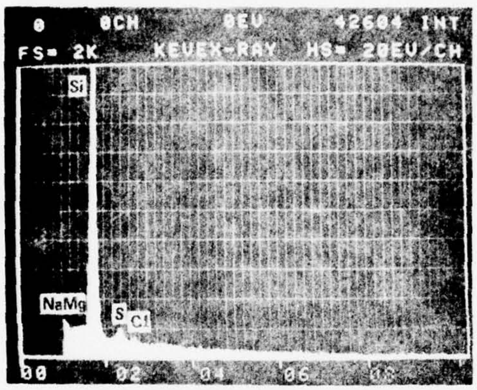
FOG 6

NRL COMPOSITE 0540-0740 8/5/75



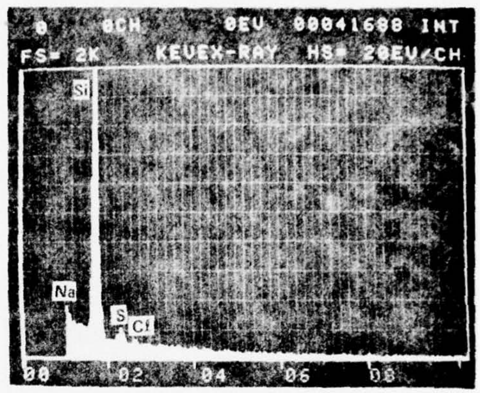
FOG 6

NRL COMPOSITE 8/6/75 0130-0715



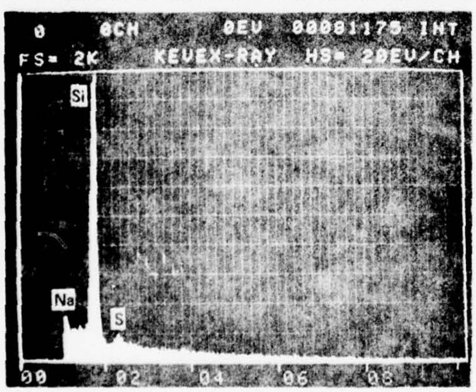
FOG 7

NRL COMPOSITE 8/6/75 0730-1200



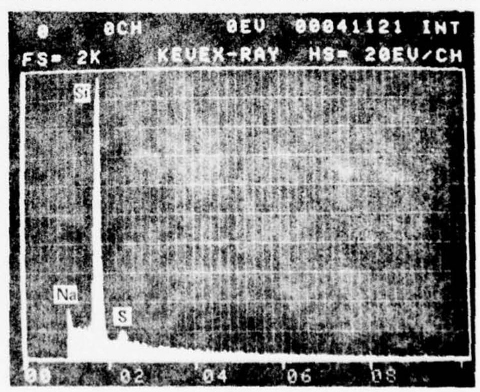
FOG 8

NRL COMPOSITE 8/7/75 0410-0730



FOG 9

NRL COMPOSITE 8/7/75-8/8/75 (1800-0615)



FOG 10

Figure 15 ENERGY DISPERSIVE X-RAY SPECTRA OF DRIED RESIDUES FROM 0.5 mℓ ALIQUOTS OF NORTH ATLANTIC FOG WATER ON A CARBON-SILICON SUBSTRATE. FOGS OF 5 AUG – 8 AUG 75 OFF THE COAST OF NOVA SCOTIA, CANADA

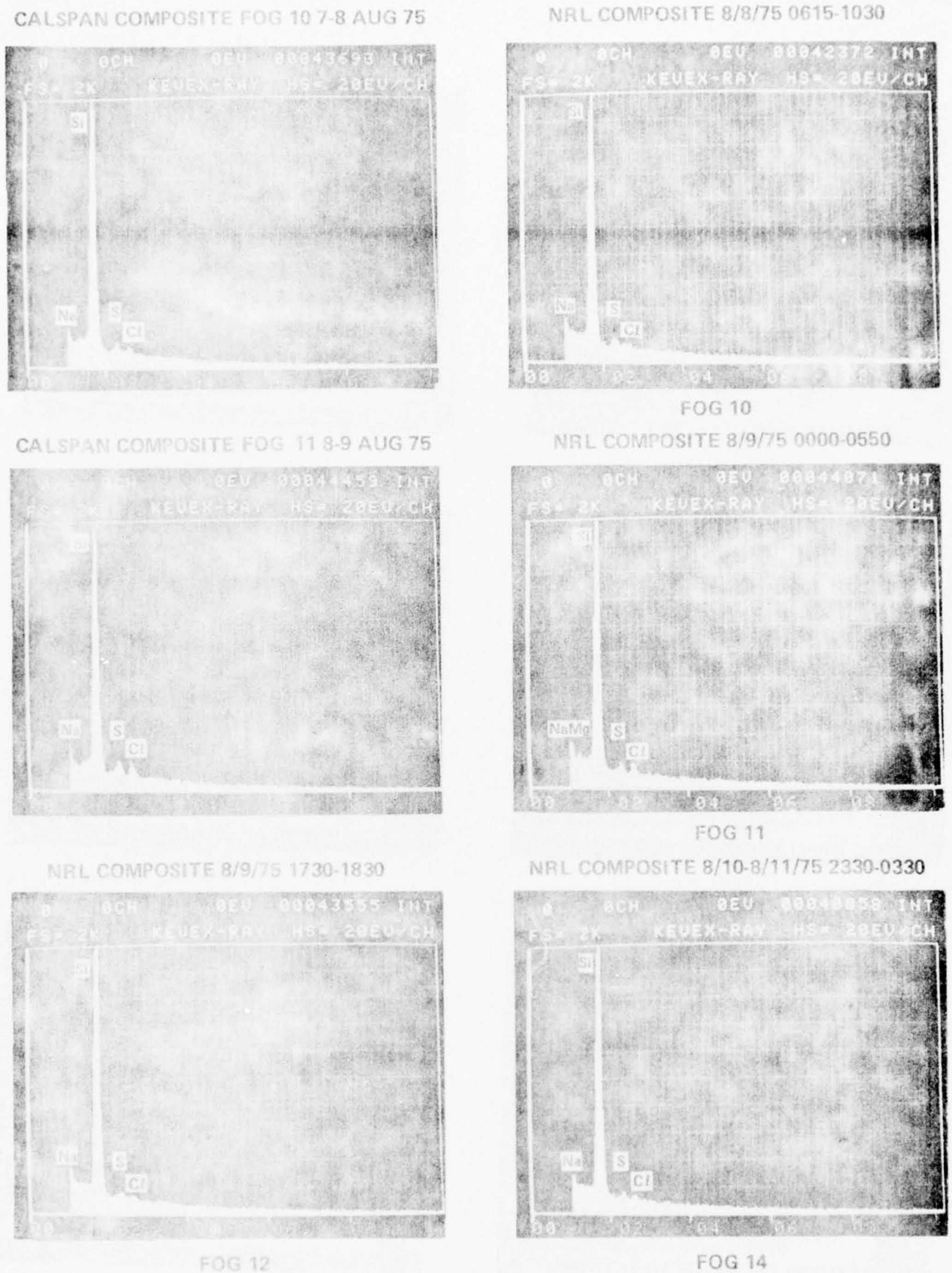


Figure 16 ENERGY DISPERSIVE X-RAY SPECTRA OF DRIED RESIDUES FROM 0.5 mℓ ALIQUOTS OF NORTH ATLANTIC FOG WATER ON A CARBON - SILICON SUBSTRATE. FOGS OF 7 AUG - 11 AUG 75 OFF THE COAST OF NOVA SCOTIA, CANADA

Figure 17 SEM OF 3 AUG 75 SAMPLE OF SPONTANEOUS FOG WATER PRECIPITATE (130X MAG, 45° TILT, 20 KV)

Figure 18 SEM OF 6 AUG 75 SAMPLE OF SPONTANEOUS FOG WATER PRECIPITATE (1500X MAG, 45° TILT, 20 KV)

Infrared Spectroscopic Analysis of Sea Fog Water Residues,
Ambient Atmospheric Aerosols, and
Related Samples Collected During the
USNS Hayes Cruise off the Coast of Nova Scotia, Canada
29 July - 12 August 1975

R. E. Baier
Calspan Corporation

Introduction

This final report on work performed under Contract No. N00173-76-C-005 between the Naval Research Laboratory and Calspan Corporation summarizes and briefly interprets the findings from at-sea analyses of marine aerosol, sea fog, and sea-surface film samples, along with a number of related specimens, collected on the 1975 fog cruise of the USNS Hayes. The reduced infrared spectroscopic data are presented in 36 well annotated composite figures, presenting 132 separate spectral traces selected from over 1000 such characterizations actually completed. Two comprehensive tables report the estimated concentrations of infrared detectable species in both the fog water samples and ambient aerosol samples available.

The primary constituents detected in these marine fog and aerosol specimens were nitrogen-hydrogen compounds; organic carbonates (probably poly-carboxylates), esters and proteins; inorganic carbonates; nitrates; sulfates; and silicates. It should be noted at the outset that all constituents of the various samples containing these chemical groupings, in every state of organization and relative solubility, contribute almost equally to the broad infrared absorption bands characteristic of each covalently-linked atom pair. These same constituents may, and probably do, analyze as separate components when wet chemical methods are utilized.

Calibration Spectra and Charts

Figures 1 through 9 present typical internal reflection infrared spectra of residues dried from constant volumes of known pure salt solutions (in distilled water) on the same germanium prisms utilized for similar analyses of fog water samples, in the identical instrument as utilized in the laboratory, aboard the USNS Hayes in July and August, 1975. Figure 10 presents a calibration plot developed from spectra such as those compiled in Figures 1 through 9, reflecting analyses of nitrate, sulfate, and carbonate compounds with sodium, potassium, and ammonium ions at concentrations from 10 parts per million to 1000 parts per million in most cases. The calibration curves collected in Figure 10 show only concentrations to 250 parts per million for the various infrared detectable salt radicals, but the curves themselves are segments of those originally drawn through the data points for concentrations up to and including 1000 ppm. The calibration curves utilized, as graphed in Figure 10, were actually first plotted for use on a previous study (Mack & Pilie', 1973). A conservative estimate of ± 50% reliability for the compositional analyses resulting from reference to these curves was provided by that study.

Important points to note in Figures 1 through 9 are the following:

Continued desiccation of dried residues of the pure salts did not lead to any significant changes in their analytical spectra, with the exception of ammonium nitrate, which sublimes away completely, and of inorganic carbonate compounds which show a significant shift in their diagnostic infrared absorption bands with continued drying. In every case, even when certified reagent-grade salts were originally dissolved in organic-free distilled water, trace amounts of organic residues could be found after water rinsing of the dried salt deposits from the prisms upon which they had been placed. This illustrates the sensitivity of the internal reflection spectroscopic method to trace organic contaminants. Gentle distilled water leaching or vigorous distilled water rinsing of such organic films, once dried onto the germanium internal reflection plates, did not significantly modify their infrared spectra in band position or intensity. The simultaneous presence of ionically bonded salts, notably sodium chloride, did not apparently influence the infrared spectra obtained since such salts do not have absorption bands in the region of the electromagnetic spectrum utilized.

Fog Water Residues

Table 1 reports the estimated concentrations of infrared-detectable species, in part per million, within the dried residues of fog water samples analyzed both aboard ship and after return to the laboratory. Discrete fog water samples collected by Calspan Corporation in small vials were analyzed, as well as composites of such samples prepared for use of the Interface Chemistry group at the Naval Research Laboratory, composites of fog water collected by NRL from a bow kite, and composites of fog water collected within NRL's shipboard-mounted conductivity measuring device. Table 1 reveals that, in every case where identical or closely related samples were analyzed both at sea within the hour of their collection, and in some cases many months later back in the laboratory, the concentrations of the constituents dissolved or suspended in the fresh fog water were substantially higher than in the aged samples. Figures 11 through 17 document this loss of constituents from the aqueous phase, and prove that loss to have been the result of flocculation and coprecipitation of both organic and inorganic fog water constituents during even short periods of storage. Important points to note from Figures 11 through 17 are the following:

There were no significant changes upon reanalysis of the same fog water residues with the passage of time (hours to days) to allow for continued drying and/or sublimation of detectable components. Thus, the sea fog water constituents apparently include little ammonium nitrate as contrasted with inland fogs previously studied where ammonium nitrate was a major constituent. There were no discernable differences in the analysis of separate aliquots of the same water sample, illustrating the reproducibility of both the drying and spectroscopic techniques. There was no significant degree of contamination developed during the evaporation of the fog water aliquots, either at sea or in the laboratory, and there was no unacceptable deterioration of the spectroscopic baselines of the constantly recleaned prisms utilized throughout the cruise. There were no significant differences in the analytical results (obtained either at sea or in the laboratory)

among samples collected by the discrete sampling method of Calspan Corporation or the two compositing techniques of NRL.

Ambient Aerosol Samples

Before and between encounters with sea fog, an aerosol impacter installed aboard the USNS Hayes by David Bressan of the Naval Research Laboratory was regularly utilized to collect ambient aerosol samples on the face of germanium internal reflection prisms. The flow through the aerosol impacter was observed to vary from 46 cubic feet per minute to 50 cubic feet per minute as the impacter inlet port was variously set from sample to sample. The aerosol samples described and documented here are typical of all those collected and analyzed at sea, from a location adjacent to Calspan's Hi-Vol sampler. The benefit of the aboard-ship aerosol analyses by infrared spectroscopy was that discrete, real time data were made available for specimens which required no extraction or chemical preparations.

Table 2 lists the estimated concentrations of infrared detectable species making up the collected aerosols at sea, with the exception of silicate compounds ("dust") for which no adequate calibration spectra have yet been developed. The reported estimates of concentration were developed as follows: Where available, the sulfate ion concentrations were obtained from the Hi-Vol composite samples returned to Calspan Corporation for laboratory analysis. The estimates of concentrations of nitrates, carbonates, and nitrogen-hydrogen compounds were made using the relative absorption ratios for the same salt concentrations, from Figure 10. For example, Fig. 10 reveals that for the same salt concentration the nitrate absorption band strength was 1.4 times greater than that of sulfate, while carbonate, and nitrogen-hydrogen compounds had bands of only 70% and 40% of the sulfate band intensity for identical concentrations of these compounds. Comparisons between the sulfate values of composite and discrete samples were not always available for the same time periods. In cases where laboratory data were missing, the compositional analyses from the infrared spectra obtained for aerosol specimens at sea were developed from direct comparison of those spectra with earlier spectra in the same air mass for similar sample collection times, which did have laboratory values to reference their sulfate absorption band intensities to. Figures 18 through 25 present typical spectra recorded at sea. The following special points revealed by Figures 18 through 25 are noteworthy: Even 10 minute aerosol collections were adequate to obtain infrared spectra showing strong absorption bands although collection periods of 30 to 60 minutes were more commonly used. Apparent dissipation regions of the sea fogs had ambient atmospheric aerosols with relatively high concentrations of nitrates, as contrasted with the apparent formation regions of these same sea fogs which had a significant absence of nitrate compounds within the ambient aerosol. Promising correlations were found between the spectroscopic indications for the presence of dust in the aerosol samples and the simultaneous indications for continental air masses obtained by Radon 222 counting techniques. There was an apparent direct correlation of the amounts of nitrate components in the collected aerosol samples with continued sun exposure of the ambient air mass.

Sea-Surface Film Samples

By mounting the same internal reflection prisms (utilized for the analysis of fog water residues and impacted aerosols at sea) at the end of a nylon filament, they could be easily dipped in and out of the sea surface to transfer ambient thicknesses of existing sea-surface films by the well known Langmuir-Blodgett mechanism. Figures 26 through 30 provide infrared spectra, and supporting data developed by ellipsometry, surface potential, and surface tension measuring techniques for typical films encountered in the Northwest Atlantic Ocean in July and August, 1975. These measurements illustrated that Sargassum weeds and Kelp fragments were exceptionally effective sources of the sea-slick-forming proteinaceous materials which must be responsible for a large fraction of the natural slicks observed at sea.

Bubble-Breaking Jet Drop Residues

Figure 31 shows internal reflection infrared spectra of salt and organic matter ejected with jet droplets from sea water used in the ship-board apparatus of Duncan Blanchard.

Carbonate Scale

Figure 32 provides two infrared spectra of an abundant carbonate scale deposited from the distilled water utilized in the University of Missouri nuclei counter aboard the USNS Hayes.

Marine Rain Residues

Figure 33 provides internal reflection infrared spectra of dried aliquots of rain collected aboard the USNS Hayes, demonstrating it to have been rich in both inorganic salts and organic matter.

Fog Water Samples from the University of Denver Chamber

Figures 34, 35, and 36 document the finding of an organic ester component, within the water samples from the University of Denver chamber, which was probably a result of plasticizer extraction from the Tygon tubing used prior to the collector in that device.

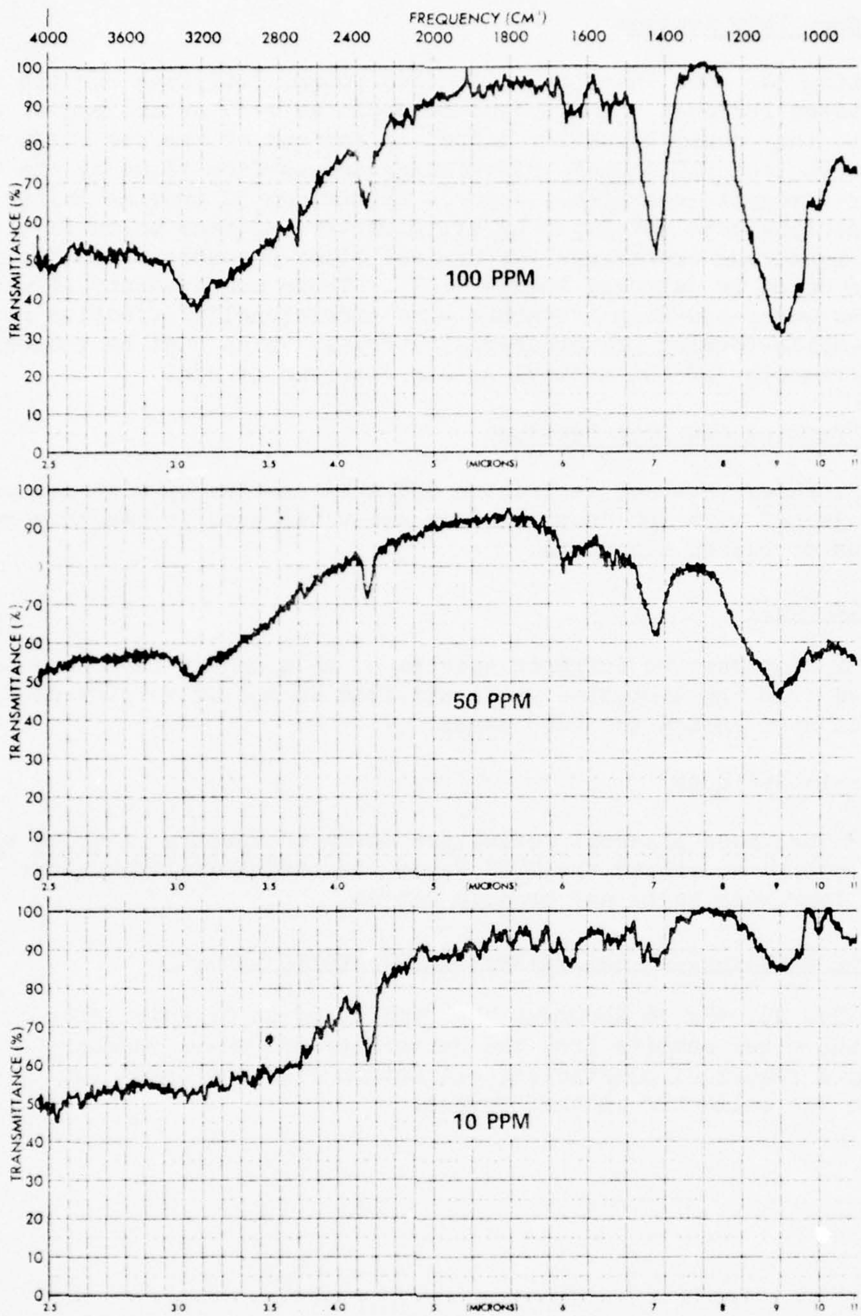


Figure 1 INTERNAL REFLECTION INFRARED SPECTRA OF RESIDUES DRIED FROM 0.5 ml ALIQUOTS OF REAGENT-GRADE AMMONIUM SULFATE SOLUTIONS (IN DISTILLED WATER) ON GERMANIUM PRISMS. CONTINUED DESICCATION OR SUBLIMATION DO NOT MODIFY THESE SPECTRA

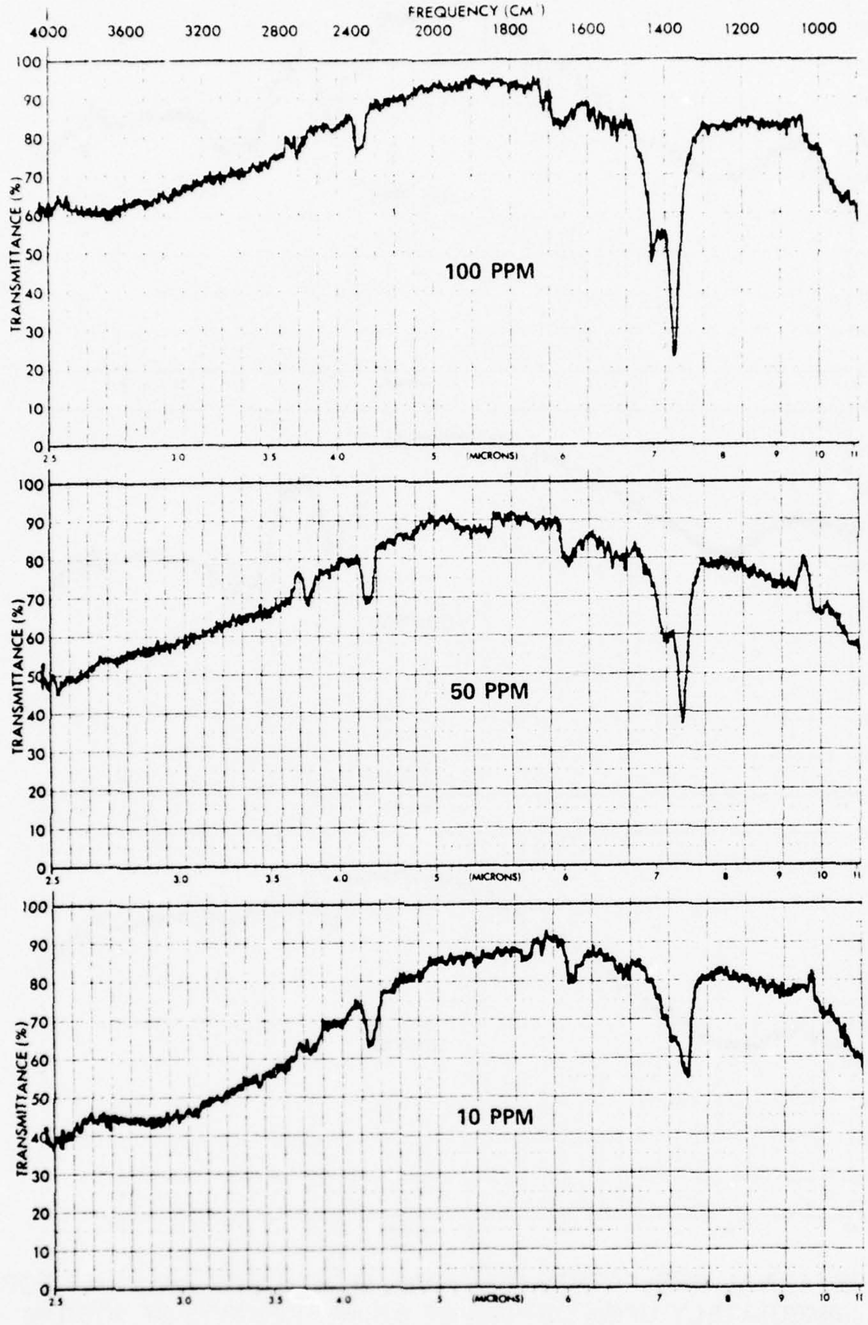


Figure 2 INTERNAL REFLECTION INFRARED SPECTRA OF RESIDUES FROM 0.5 ml ALIQUOTS OF SODIUM NITRATE SOLUTIONS (IN DISTILLED WATER) EVAPORATED TO DRYNESS ON GERMANIUM PRISMS. CONTINUED DRYING AND/OR SUBLIMATION PHENOMENA DO NOT CHANGE THESE SPECTRA

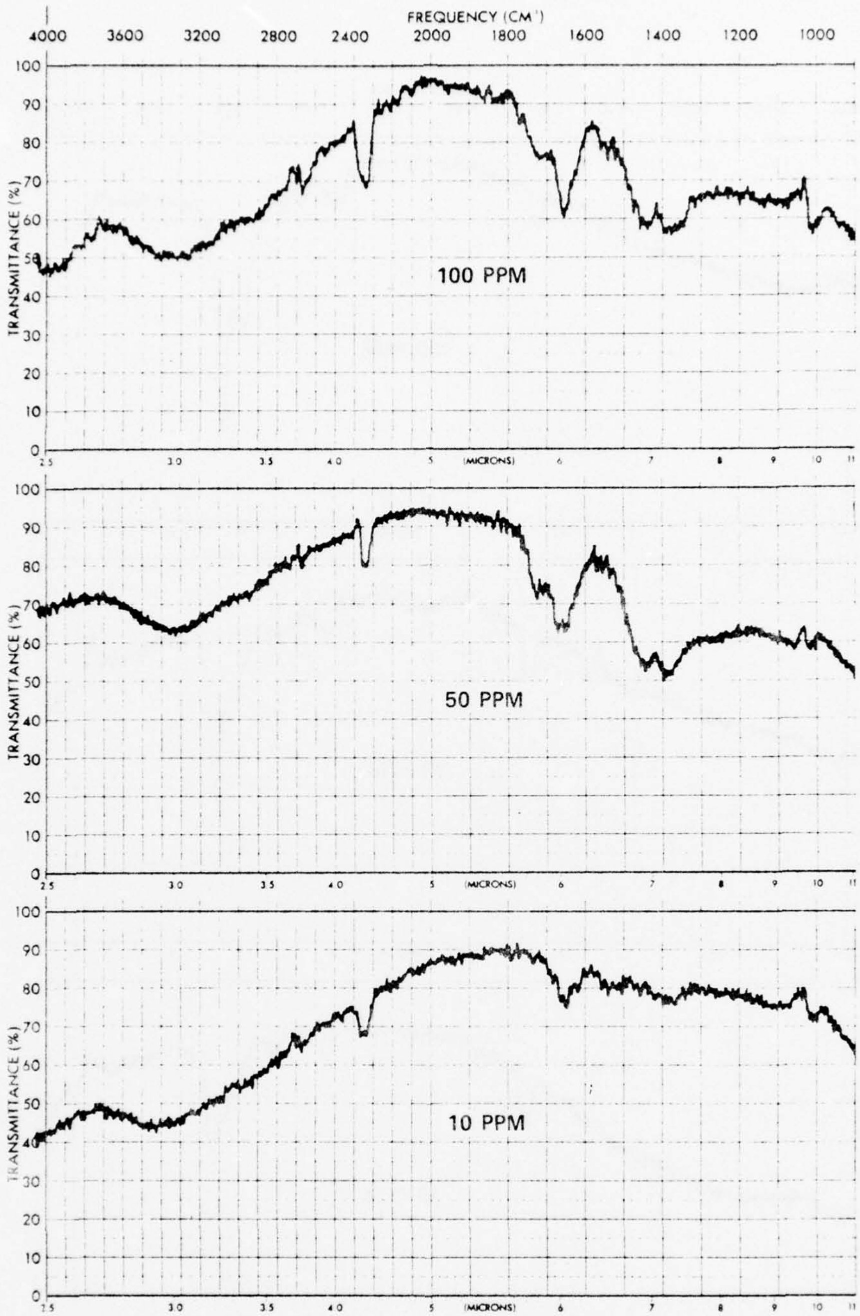


Figure 3 INTERNAL REFLECTION INFRARED SPECTRA OF RESIDUES FORMED IMMEDIATELY UPON DRYING OF 0.5 ml ALIQUOTS OF SODIUM CARBONATE SOLUTIONS (IN DISTILLED WATER) ON GERMANIUM PRISMS. THESE SPECTRA DO SHIFT IN PEAK PATTERN AND INTENSITY WITH CONTINUED DRYING, AS ILLUSTRATED IN FIGURES 8 AND 9

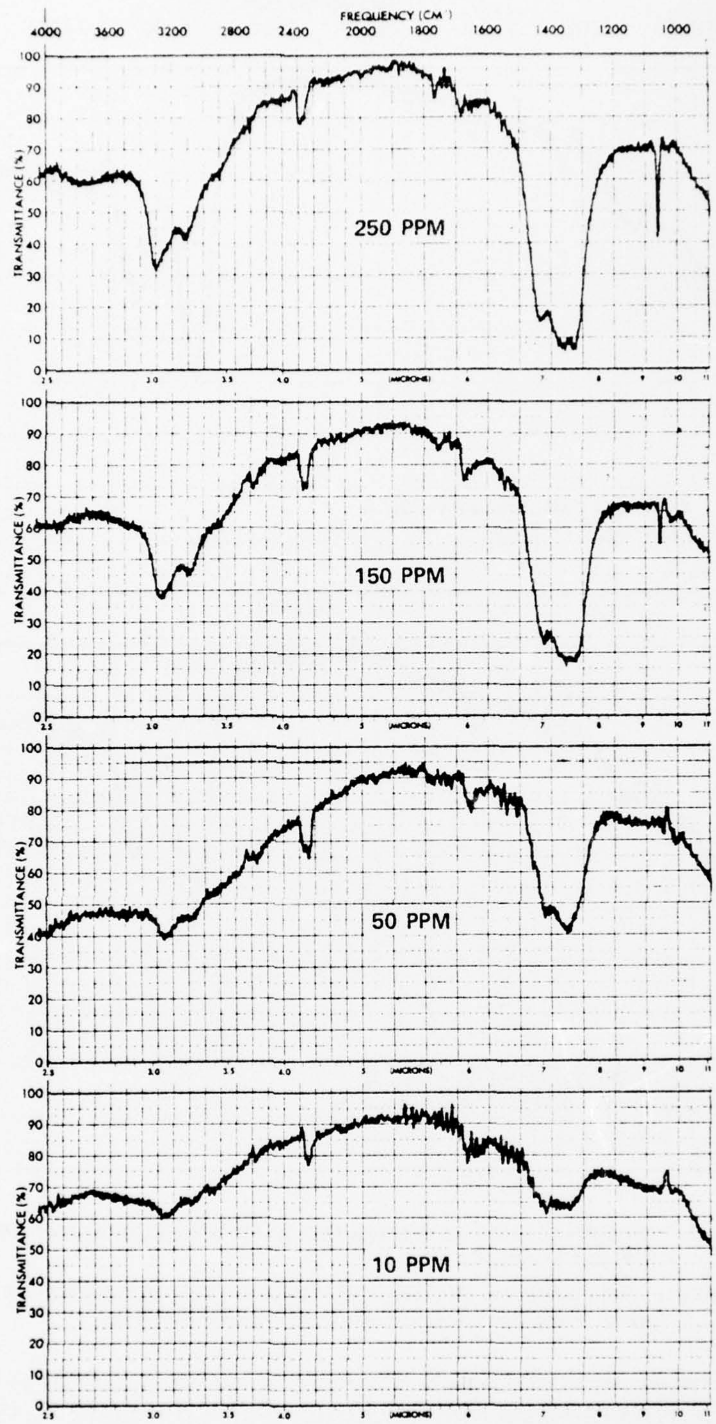
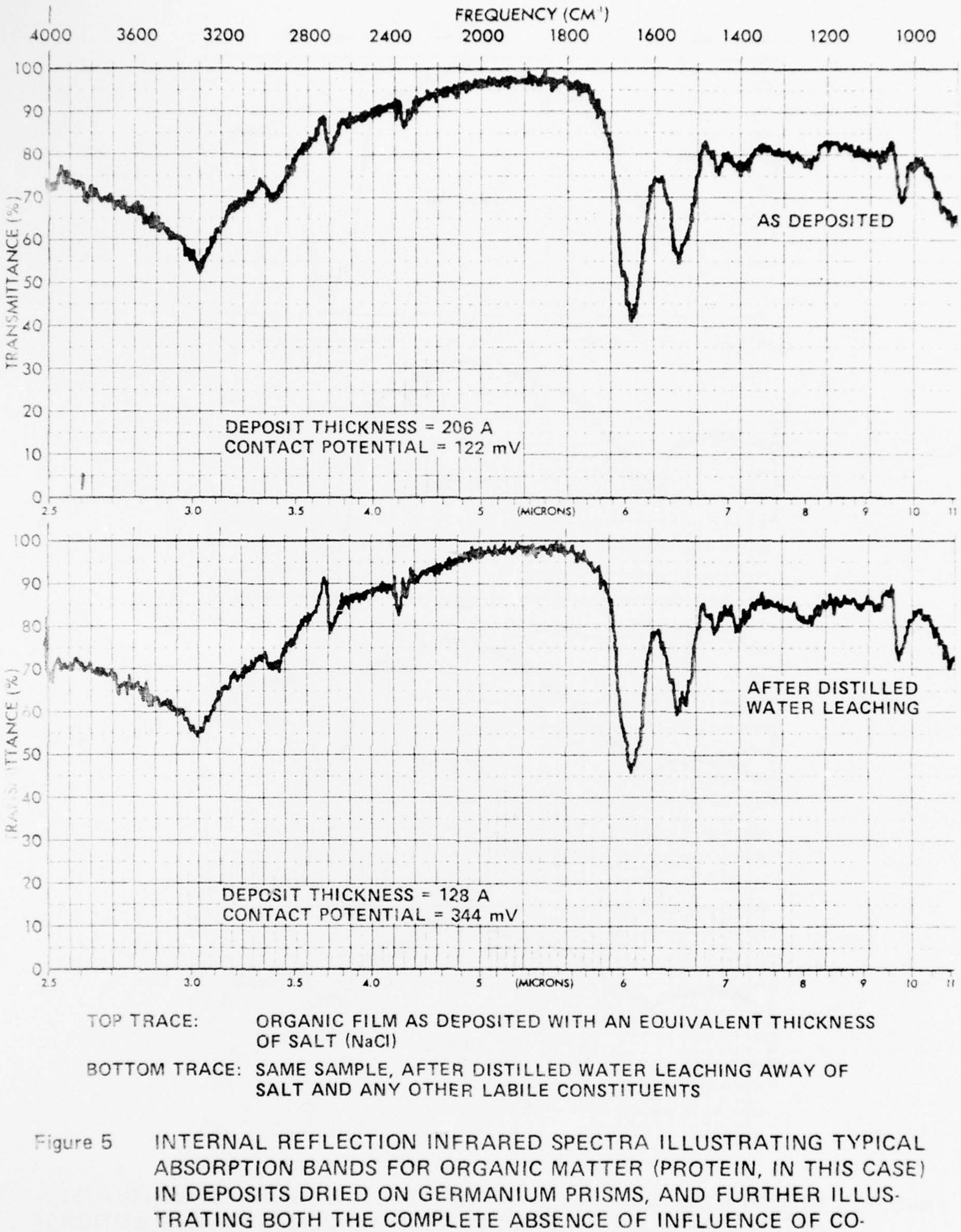


Figure 4 INTERNAL REFLECTION INFRARED SPECTRA OBTAINED IMMEDIATELY AFTER DRYING 0.5 ml ALIQUOTS OF AMMONIUM NITRATE SOLUTIONS (IN DISTILLED WATER) ON GERMANIUM PRISMS. ALL ABSORPTION BANDS SHOWN DIMINISH IN INTENSITY WITH CONTINUED DRYING TIME, AS THE SALT DEPOSIT SUBLIMES COMPLETELY AWAY. FIGURE 7 ILLUSTRATES THE FINAL SPECTRUM AFTER SUBLIMATION



TOP TRACE: ORGANIC FILM AS DEPOSITED WITH AN EQUIVALENT THICKNESS OF SALT (NaCl)

BOTTOM TRACE: SAME SAMPLE, AFTER DISTILLED WATER LEACHING AWAY OF SALT AND ANY OTHER LABILE CONSTITUENTS

Figure 5 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING TYPICAL ABSORPTION BANDS FOR ORGANIC MATTER (PROTEIN, IN THIS CASE) IN DEPOSITS DRIED ON GERMANIUM PRISMS, AND FURTHER ILLUSTRATING BOTH THE COMPLETE ABSENCE OF INFLUENCE OF CO-DEPOSITED SODIUM CHLORIDE AND THE RESISTANCE OF THE ORGANIC MATTER TO REMOVAL BY DISTILLED WATER

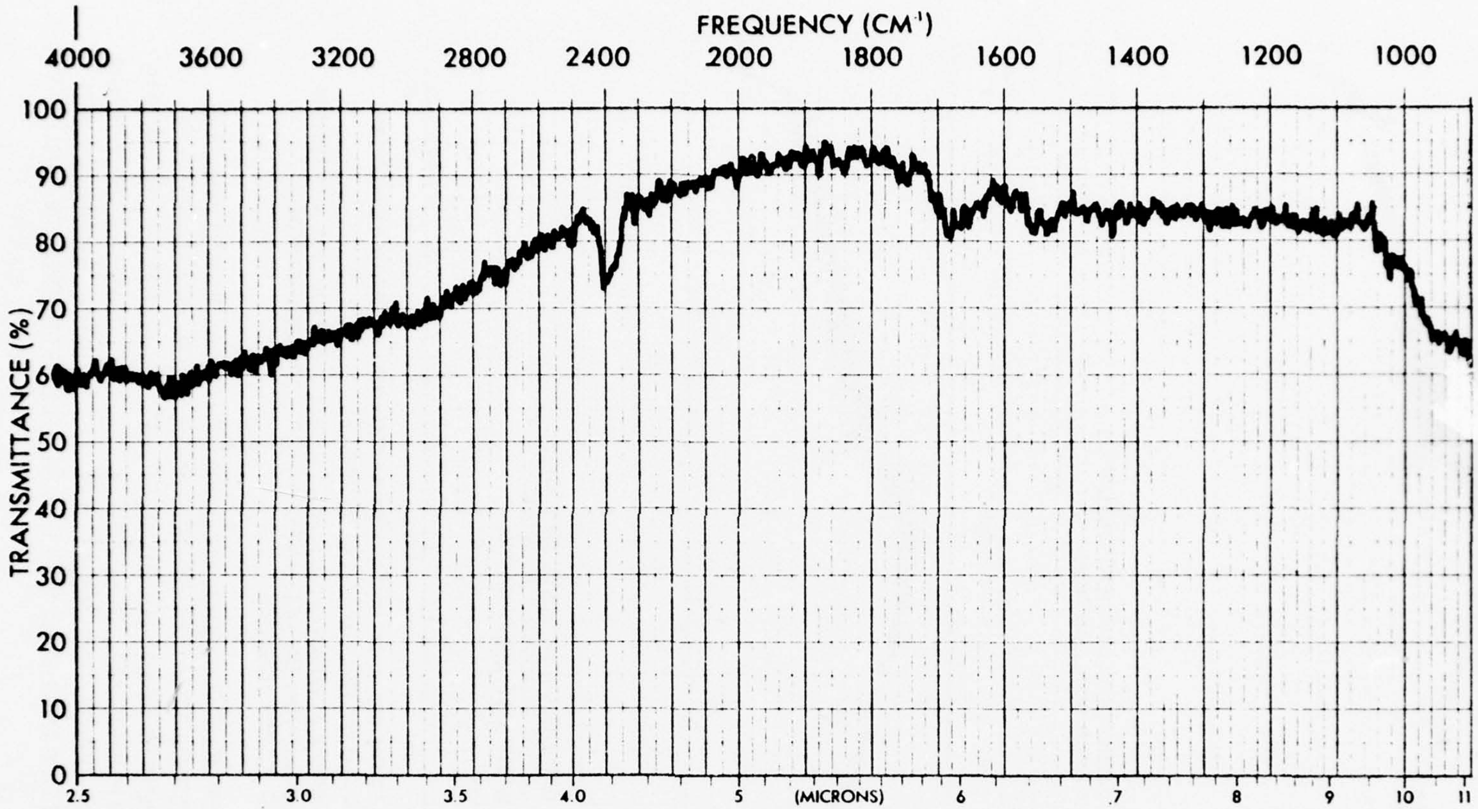
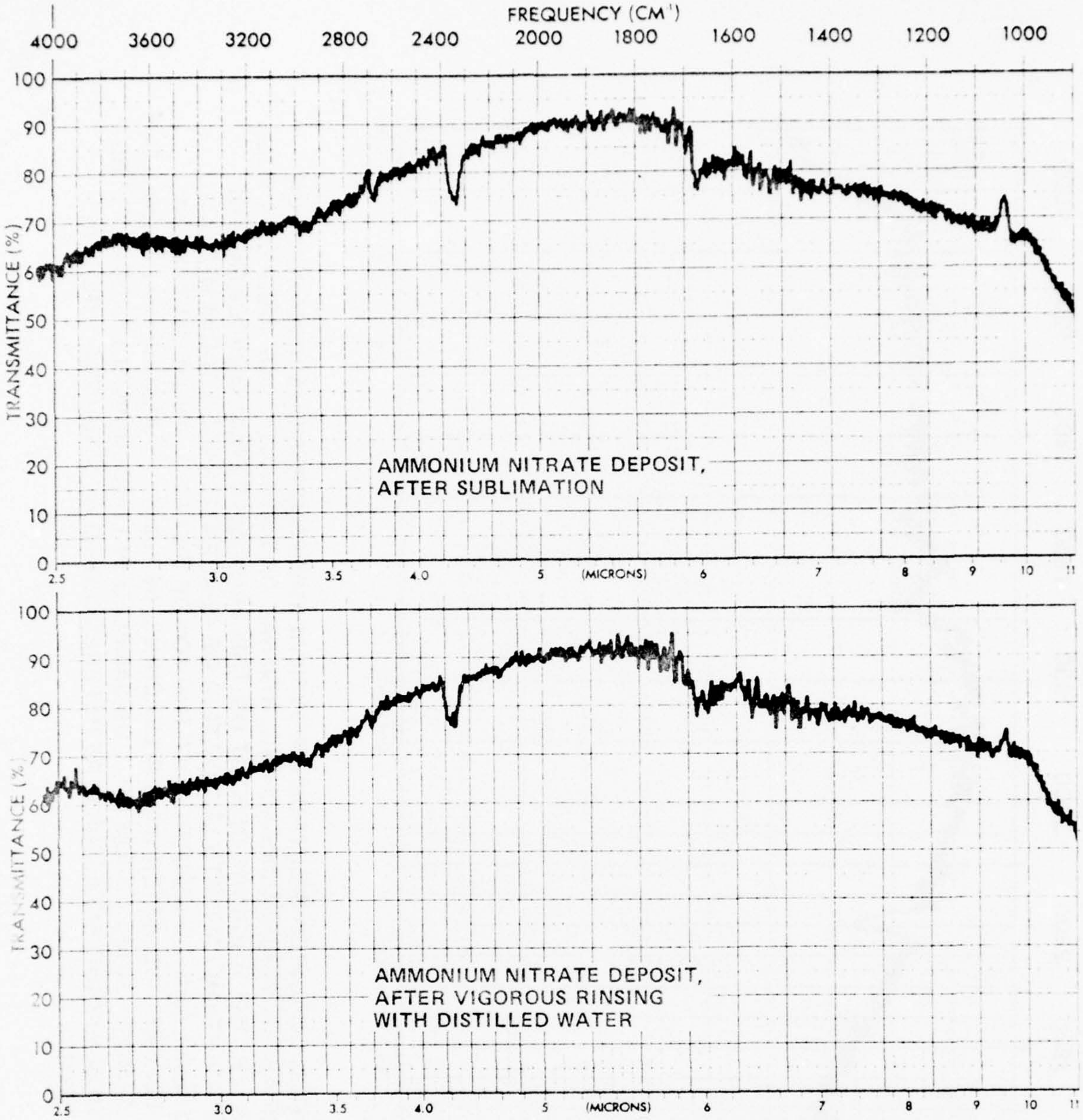


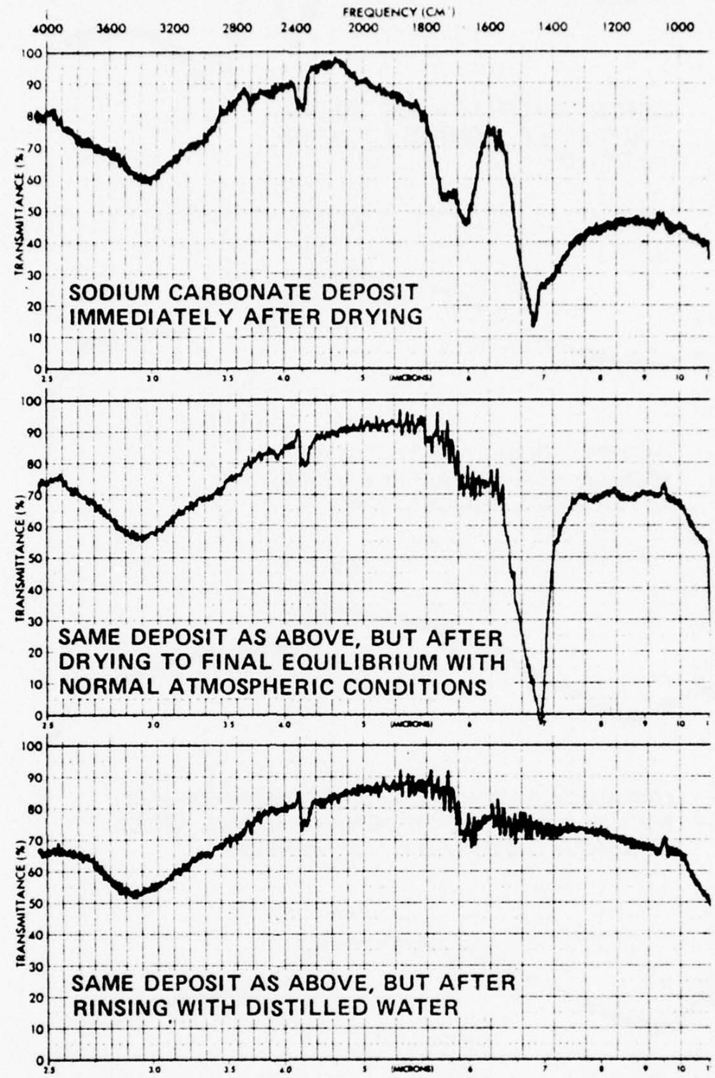
Figure 6 INTERNAL REFLECTION INFRARED SPECTRUM OF TYPICAL ORGANIC RESIDUE REMAINING ON GERMANIUM PRISMS AFTER VIGOROUS LEACHING, RINSING, OR EXTRACTION OF SALT DEPOSITS WITH DISTILLED WATER. THE ORIGINAL DEPOSIT ON THIS PRISM WAS FROM DESICCATION OF 0.5 ml OF A 100 PPM SOLUTION (IN DISTILLED WATER) OF REAGENT-GRADE SODIUM NITRATE. COMPARE WITH ORIGINAL SAMPLE SPECTRUM AT THE TOP OF FIGURE 2, AND WITH TYPICAL PROTEIN SPECTRA, BEFORE AND AFTER WATER LEACHING, IN FIGURE 5. ABSORPTION BAND NEAR 2400 CM^{-1} IS FROM ATMOSPHERIC CARBON DIOXIDE SAMPLED IN LONGER PATH LENGTH OF THE INTERNAL REFLECTION MIRROR ACCESSORY, AS REFERENCED TO A "STRAIGHT-THROUGH" REFERENCE BEAM PATH.



TOP TRACE: RESIDUE FROM 0.5 ml OF A 200 PPM AMMONIUM NITRATE SOLUTION (IN DISTILLED WATER) AFTER SUBLIMATION

BOTTOM TRACE: RESIDUE FROM A SEPARATE 0.5 ml ALIQUOT OF A 200 PPM AMMONIUM NITRATE SOLUTION (IN DISTILLED WATER), AFTER VIGOROUS DISTILLED WATER RINSING

Figure 7 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING THE COMPLETENESS OF SPONTANEOUS SUBLIMATION OF AMMONIUM NITRATE DEPOSITS FROM DRIED RESIDUES ON GERMANIUM PRISMS. COMPARE WITH ORIGINAL SPECTRA, OBTAINED IMMEDIATELY UPON DRYING FROM SOLUTIONS, AS SHOWN IN FIGURE 4. RESIDUES ARE PREDOMINANTLY ORGANIC MATTER, AS ILLUSTRATED IN FIGURES 5 AND 6



TOP TRACE: DEPOSIT FROM 0.5 ml OF A 500 PPM SOLUTION OF REAGENT GRADE SODIUM CARBONATE (IN DISTILLED WATER) AS DRIED ON A GERMANIUM PRISM

MIDDLE TRACE: 0.5 ml OF 500 PPM SODIUM CARBONATE DRIED ONTO A GERMANIUM PRISM AND ALLOWED TO COME TO EQUILIBRIUM OVER A 24-HOUR PERIOD

BOTTOM TRACE: DEPOSIT FROM 500 PPM SODIUM CARBONATE SOLUTION, AFTER DISTILLED WATER RINSING

Figure 8 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING ABSORPTION BAND SHIFTS FOR SODIUM CARBONATE DEPOSITS DURING CONTINUED DRYING, AND THE SUSCEPTIBILITY OF THE MAJOR INORGANIC FRACTION OF THESE DEPOSITS TO REMOVAL BY DISTILLED WATER. COMPARE WITH ORIGINAL SPECTRA OF FIGURE 3, AND WITH ORGANIC RESIDUE SPECTRA IN FIGURES 5, 6, AND 7

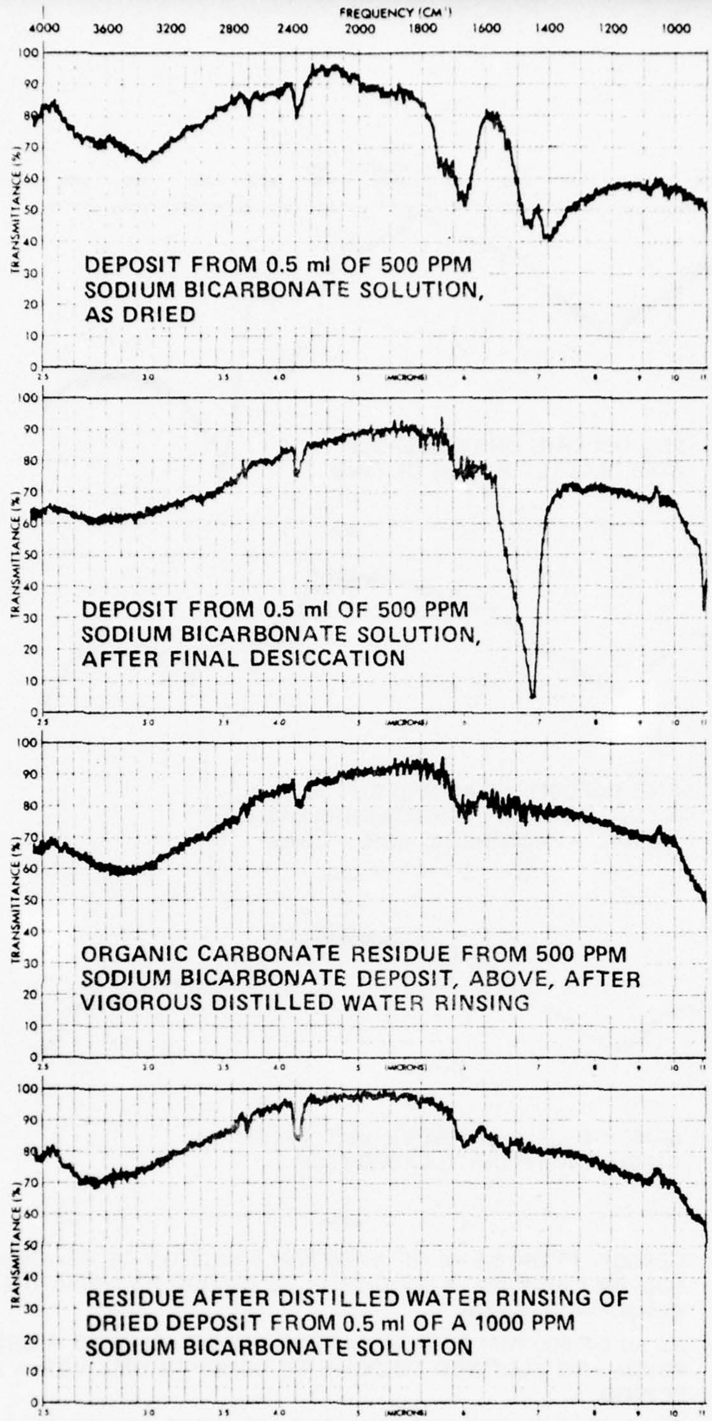


Figure 9 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING SHIFTS IN ABSORPTION BANDS FOR SODIUM BICARBONATE RESIDUES DURING CONTINUED DESICCATION, AND ALSO ILLUSTRATING THE CONSTANT PRESENCE OF ORGANIC CARBONATE CONSTITUENTS -- RESISTANT TO WATER EXTRACTION -- IN EVEN REAGENT-GRADE SALT SOLUTIONS. COMPARE WITH SODIUM CARBONATE SPECTRA IN FIGURES 3 AND 8, AND WITH ORGANIC RESIDUE SPECTRA IN FIGURES 5, 6, AND 7

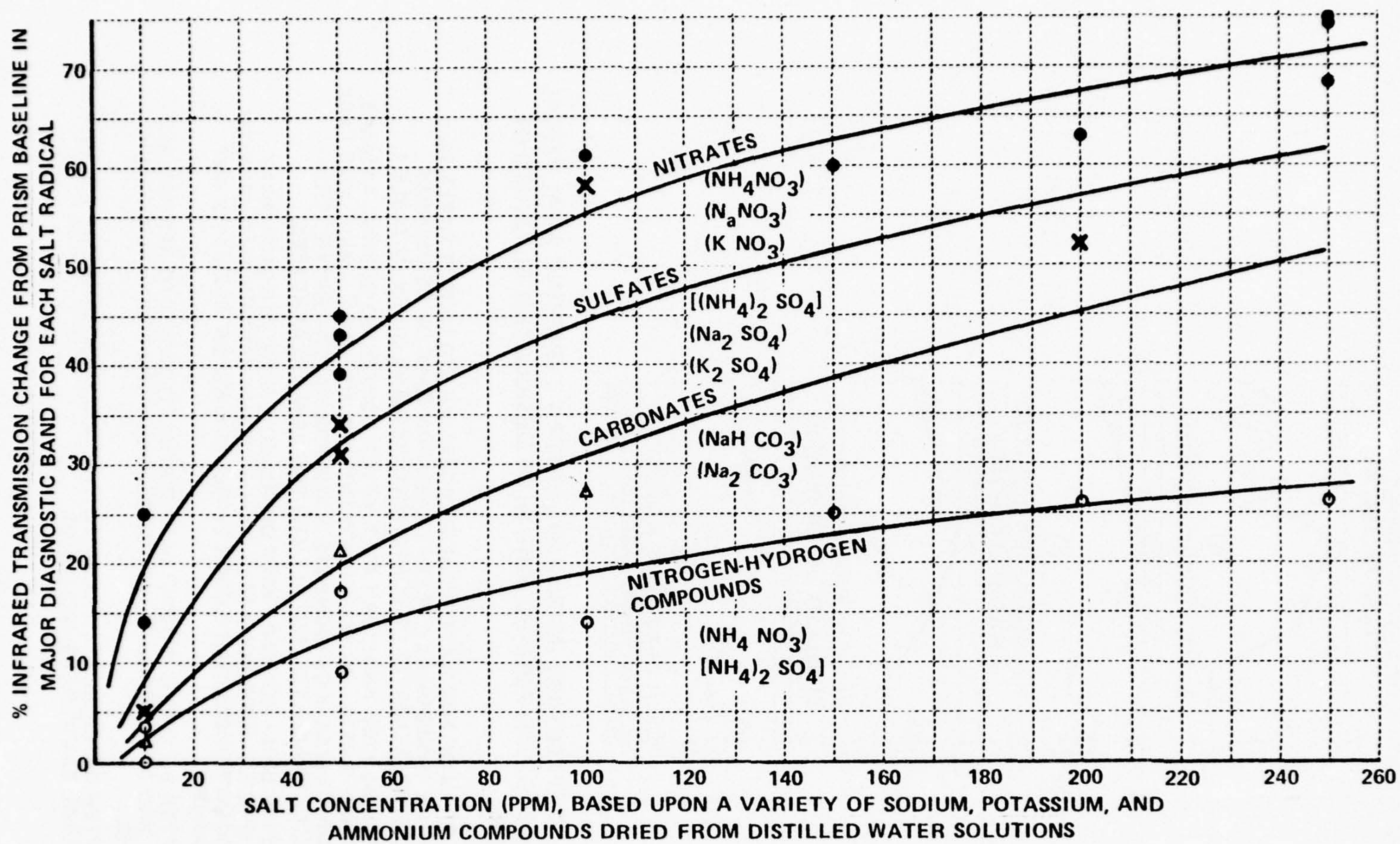


Figure 10 CALIBRATION PLOT DEVELOPED FROM SPECTRA SUCH AS THOSE GIVEN IN FIGURES 1 THROUGH 9, ALLOWING QUANTITATIVE ESTIMATES OF THE QUANTITIES OF SALTS PRESENT IN VARIOUS AQUEOUS SAMPLES, DRIED -- FROM CONSISTENT VOLUMES -- ONTO GERMANIUM PRISMS AND ANALYZED BY INTERNAL REFLECTION INFRARED SPECTROSCOPY. DIFFERENT RESIDUE DISTRIBUTIONS ON THE PRISMS, DIFFERENT PRISM BASELINES, AND DIFFICULTIES WITH ACCURATE DISPENSING OF SOLUTIONS LIMIT THE RELIABILITY OF THESE COMPOSITIONAL ESTIMATES TO ±50%, ALTHOUGH THE QUALITATIVE SENSITIVITY IS ABOUT 5 PPM IN ALL CASES.

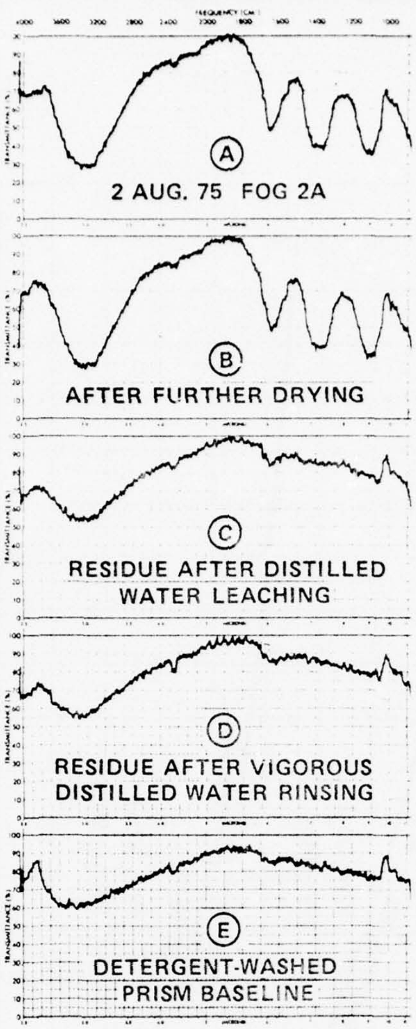


Figure 11 INTERNAL REFLECTION INFRARED SPECTRA TYPIFYING ANALYTICAL RESULTS OBTAINED ABOARD SHIP WITH DESICCATED ALIQUOTS OF FOG WATER

(A) APPROXIMATELY 0.5 ml OF FOG WATER (CALSPAN VIAL #3) COLLECTED EARLY IN FOG 2A, OF 2 AUG. 75, IMMEDIATELY AFTER DRYING ON FACE OF GERMANIUM PRISM. QUANTITATIVE ESTIMATES OF COMPONENTS PRESENT GIVEN IN TABLE 1.

(B) SAME SAMPLE, RE-ANALYZED AN HOUR LATER AFTER CONTINUED DRYING. ABSENCE OF ABSORPTION BAND SHIFTS -- IN EITHER POSITION OR INTENSITY -- INDICATES LACK OF SUBLIMABLE OR UNSTABLE COMPONENTS IN THE FOG WATER RESIDUE. THIS SPECTRAL STABILITY CHARACTERIZED ALL SEA FOG SAMPLES ANALYZED.

(C) SAME SAMPLE, AFTER BRIEF CONTACT WITH DISTILLED WATER TO LEACH AWAY WATER-SOLUBLE SPECIES. APPROXIMATELY 30 ppm OF THE ORIGINALLY INDICATED 180 ppm ORGANIC MATTER CONCENTRATION IN THE FOG WATER WAS RESISTANT TO RESOLUBILIZATION.

(D) SAME SAMPLE, AFTER VIGOROUS RINSING WITH DISTILLED WATER TO REMOVE ALL LABILE ORGANIC AND SALT DEPOSITS. ABOUT 20 ppm OF THE ORIGINAL ORGANIC CONTENT REMAINS.

(E) SAME SAMPLE, AFTER DETERGENT WASHING TO RESTORE PRISM BASELINE AGAINST WHICH ALL SPECTRAL BANDS WERE MEASURED.

Table 1
SEA FOG WATER SAMPLES
ESTIMATED CONCENTRATIONS OF INFRARED DETECTABLE SPECIES
(IN PARTS PER MILLION [PPM])

FOG WATER SAMPLE (EASTERN DAYLIGHT TIME)	DESCRIPTION	NH COMPOUNDS	ORGANIC CARBONATES, ESTERS, PROTEINS	INORGANIC CARBONATES	NITRATES	SULFATES
2 AUG 75 ~1930	DISCRETE FOG WATER SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. CALSPAN VIAL #3 - JUST ENTERING FOG 2A.	> 300	180	200	60	80
3 AUG 75 1700	DISCRETE FOG WATER SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. CALSPAN VIAL #18, ABOUT MIDWAY INTO FOG 4A.	> 200	105	50	10	35
3 AUG 75 1600←1800	COMPOSITE FOG WATER SAMPLE #1, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MIDWAY INTO FOG 4A.	65	35	50	10	25
3 AUG 75 1900←2000	COMPOSITE BOWKITE FOG WATER SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. MIDWAY INTO FOG 4A.	> 200	80	45	10	40
3 AUG 75 1800←2000	COMPOSITE FOG WATER SAMPLE #2, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MIDWAY INTO FOG 4A.	110	50	35	7	20
3 AUG 75 2000←2100	COMPOSITE FOG WATER SAMPLE #3, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. JUST EXITING FOG 4A.	120	50	22	< 5	20
4 AUG 75 1000←1100	COMPOSITE BOWKITE SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR IF ITS COLLECTION. MIDPOINT OF FOG 4C.	> 300	160	70	10	50
4 AUG 75 0800←1400	COMPOSITE FOG WATER SAMPLE #4, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MIDPOINT OF FOG 4C.	190	35	25	5	20
4 AUG 75 1400←1430	COMPOSITE FOG WATER SAMPLE FROM NRL CONDUCTIVITY CELL, ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. MIDPOINT OF FOG 4C.	> 200	75	50	8	45
4 AUG 75 1400←1430	COMPOSITE FOG WATER SAMPLE #5, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MIDPOINT OF FOG 4C.	70	50	22	5	30
4 AUG 75 ~1400	DISCRETE FOG WATER SAMPLE ANALYZED AT CALSPAN AFTER RETURN TO LABORATORY. CALSPAN VIAL #41. FOG 4C.	90	25	25	10	30
4 AUG 75 ~0700←1900	COMPOSITE OF DISCRETE FOG WATER SAMPLES (CALSPAN VIALS #29← 57), ANALYZED AFTER RETURN TO LABORATORY. FOGS 4C, D.	< 5	20	12	< 5	25
5 AUG 75 0400←0540	COMPOSITE FOG WATER SAMPLE #6, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MIDPOINT OF FOG 6.	90	35	18	5	25

Table 1 (Continued)
SEA FOG WATER SAMPLES
ESTIMATED CONCENTRATIONS OF INFRARED DETECTABLE SPECIES
(IN PARTS PER MILLION [PPM])

FOG WATER SAMPLE (EASTERN DAYLIGHT TIME)	DESCRIPTION	NH COMPOUNDS	ORGANIC CARBONATES, ESTERS, PROTEINS	INORGANIC CARBONATES	NITRATES	SULFATE
5 AUG 75 ~0700	DISCRETE FOG WATER SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. CALSPAN VIAL #64. JUST EXITING FOG 6.	110	25	35	8	30
5 AUG 75 0540→0740	COMPOSITE FOG WATER SAMPLE #7, COLLECTED BY NRL, ANALYZED AT CALSPAN AFTER RETURN TO LABORATORY. LATTER HALF OF FOG 6.	20	25	10	< 5	12
6 AUG 75 0100	DISCRETE FOG WATER SAMPLE ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. CALSPAN VIAL #68. MIDPOINT OF FOG 7E.	> 200	75	70	10	50
6 AUG 75 0100→0700	COMPOSITE OF DISCRETE FOG WATER SAMPLES PREPARED FOR NRL INTERFACE CHEMISTRY LAB, ANALYZED ABOARD SHIP IMMEDIATELY AFTER COLLECTION. FOGS 7E, 7S, AND 7W.	170	50	50	10	50
6 AUG 75 0130→0715	COMPOSITE FOG WATER SAMPLE #8, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOGS 7E, 7S, AND 7W.	40	10	10	5	35
6 AUG 75 0730→1200	COMPOSITE FOG WATER SAMPLE #9, COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOGS 7W AND 8.	36	35	12	< 5	35
7 AUG 75 0410→0730	COMPOSITE FOG WATER SAMPLE #10. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. MID-SECTION OF FOG 9.	50	25	10	0	15
7 AUG 75 1800→2200 8 AUG 75 0300→0615	COMPOSITE FOG WATER SAMPLE #11. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOGS 10A, B.	< 5	18	24	< 5	35
8 AUG 75 0615→1030	COMPOSITE FOG WATER SAMPLE #12. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOG 10C.	20	25	18	< 5	35
7-8 AUG 75	COMPOSITE OF DISCRETE FOG WATER SAMPLES (CALSPAN VIALS #96-127) ANALYZED AFTER RETURN TO LABORATORY. FOGS 10A, B, C.	10	15	30	10	26
9 AUG 75 0000→0550	COMPOSITE FOG WATER SAMPLE #13. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOG 11B.	80	35	30	5	20
9 AUG 75 1730→1830	COMPOSITE FOG WATER SAMPLE #14. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOG 12.	10	22	10	< 5	18
10-11 AUG 75 2330→0330	COMPOSITE FOG WATER SAMPLE #15. COLLECTED BY NRL, ANALYZED BY CALSPAN AFTER RETURN TO LABORATORY. FOG 14.	10	15	13	0	12
JAN 1973	COMPOSITE OF DISCRETE SAMPLES OF ALL INLAND FOGS AT TRAVIS AFB IN JANUARY, 1973, ANALYZED AT CALSPAN AFTER RETURN TO LABORATORY.	25	24	110	50	35

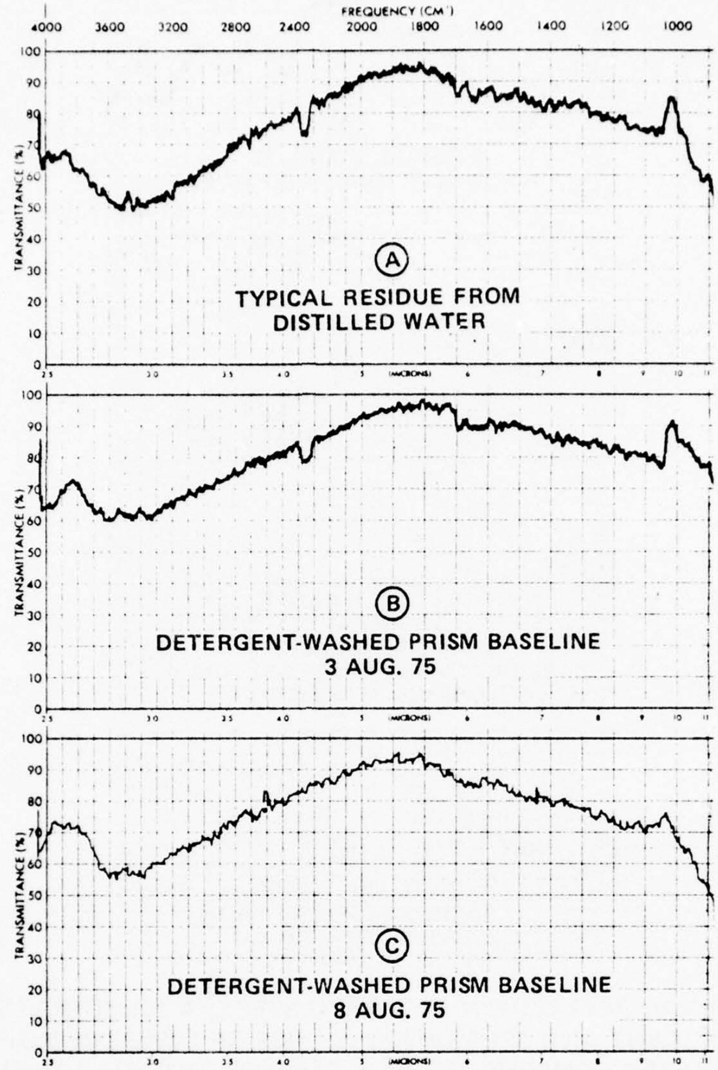


Figure 12 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED ABOARD SHIP, REVEALING THE DEGREE OF CONTAMINATION AND/OR SPECTRAL DETEORIORATION ENCOUNTERED DURING REAL-TIME ANALYSES AT SEA

Ⓐ APPROXIMATELY 0.5 ml OF DISTILLED WATER EVAPORATED TO DRYNESS. DEVIATIONS FROM LABORATORY BASELINE, OR FROM DETERGENT-WASHED SHIPBOARD BASELINES, RESULT FROM (1) CONTAMINANTS PICKED UP BY THE WATER DURING SAMPLE DESICCATION (IN A REFLECTED WARM AIR STREAM FROM A VACUUM CLEANER BLOWER) IN THE SAME MANNER AS ALL FOG WATER ALIQUOTS WERE DRIED AT SEA, AND (2) ANALYSIS AT THE NEAR-100% RELATIVE HUMIDITY CHARACTERIZING MARITIME ENVIRONMENTS. THESE CONDITIONS ACCOUNT FOR MAXIMUM OVER-ESTIMATES OF FOG WATER CONCENTRATION OF N-H COMPOUNDS BY 50 ppm AND OF ORGANIC CARBONATES, ESTERS, AND PROTEINS BY 10 ppm. NO INFLUENCE ON INORGANIC CARBONATES, NITRATES, OR SULFATES IS SEEN.

Ⓑ DETERGENT-WASHED PRISM BASELINE FOR SAME PRISM USED IN PRODUCING DATA OF FIGURE 11 AND Ⓐ, ABOVE, AFTER USE IN APPROXIMATELY 50 ANALYSES.

Ⓒ DETERGENT-WASHED PRISM BASELINE, SHOWING MODEST SPECTRAL DETERIORATION, FIVE DAYS LATER AFTER USE FOR AN ADDITIONAL SET OF ABOUT 100 INFRARED ANALYSES.

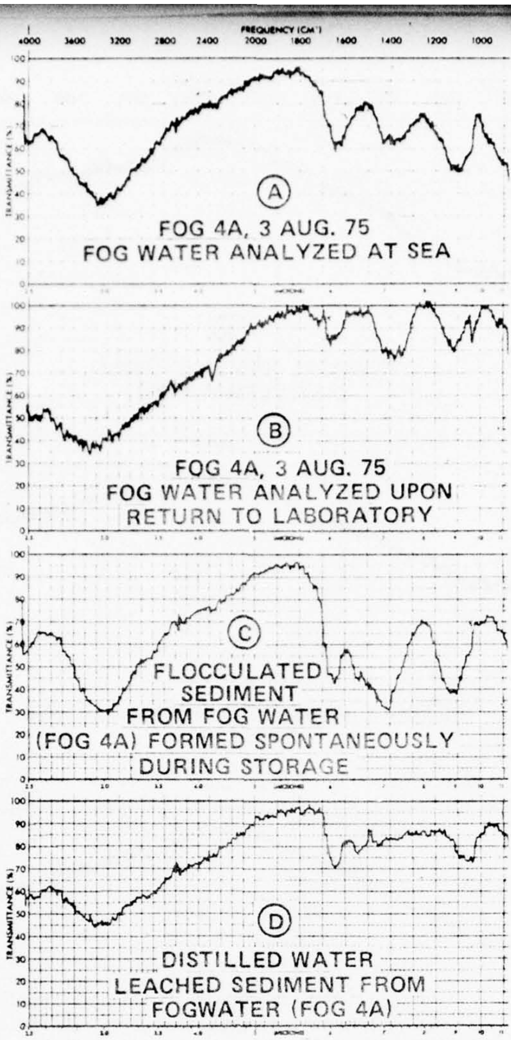


Figure 13 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING THE SIGNIFICANT AND SPONTANEOUS LOSS OF DISSOLVED OR SUSPENDED FOG WATER COMPONENTS TO A FLOCCULANT, GELATINOUS PRECIPITATE DURING DARK (AND EVEN STERILE) STORAGE

Ⓐ CALSPAN VIAL #18 OF FOG WATER OBTAINED AT 1700 E.D.T., 3 AUG. 75, IN FOG 4A, ANALYZED ABOARD SHIP WITHIN THE HOUR OF ITS COLLECTION. SEE TABLE 1 FOR COMPOSITIONAL DATA FROM THE SPECTRUM OF THE DRIED FOG WATER RESIDUE. FOG WATER CONDUCTIVITY MEASURED AT SEA WAS 275 $\mu\Omega^{-1}$/cm. IT SHOWED NO SIGNIFICANT SURFACE ACTIVITY. THE DRIED RESIDUE DID SHOW DEFINITE SURFACE ACTIVITY, SPREADING RAPIDLY ON WATER AGAINST A 5 DYNE/cm PISTON FILM.

Ⓑ COMPOSITE SAMPLE OF FOG 4A WATER COLLECTED BY NRL FROM 1600 → 1800, 3 AUG. 75, BUT NOT ANALYZED UNTIL RETURN TO LABORATORY. NOTE SIGNIFICANT DEPRESSION OF ALL ABSORPTION BANDS. COMPOSITIONAL DATA IN TABLE 1.

Ⓒ SPONTANEOUSLY FORMED FLOC FLOATING IN NRL-COLLECTED FOG 4A WATER COMPOSITE (BOWKITE COLLECTION, 1615 → 1745, 3 AUG. 75) BY 8 AUG. 75, ANALYZED ABOARD SHIP. THIS PRECIPITATE IS VERY RICH IN N-H COMPOUNDS, ORGANIC AND INORGANIC CARBONATES, NITRATES AND SULFATES.

Ⓓ PRECIPITATE OF Ⓒ, ABOVE, AFTER DISTILLED WATER EXTRACTION OF SOLUBLE MATTER. REMAINING MASS IS TYPICAL OF GLYCOPROTEINS, COMMON BIOLOGICAL EXUDATES

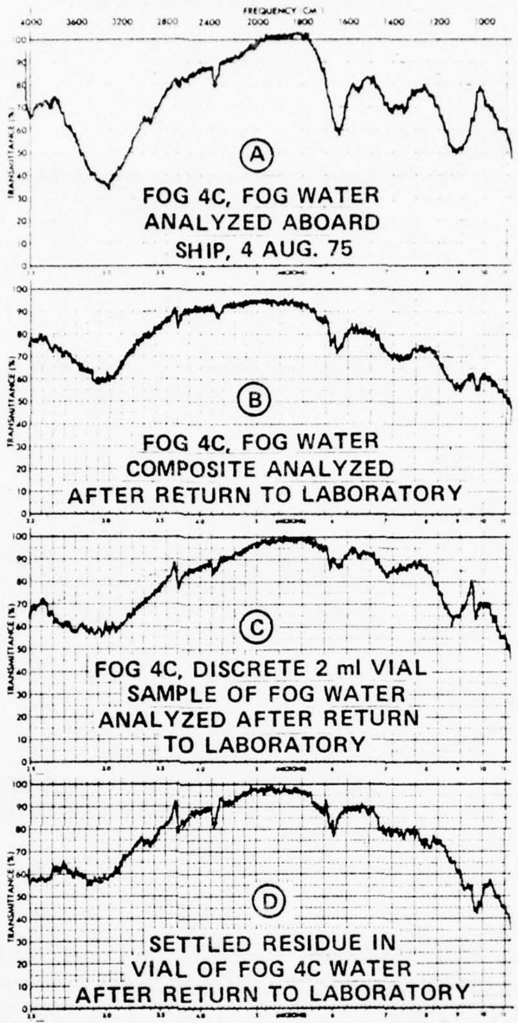


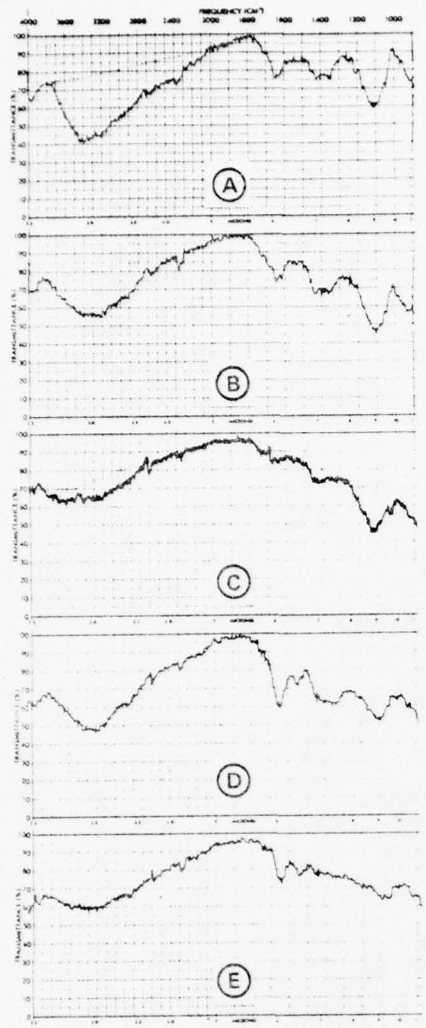
Figure 14 INTERNAL REFLECTION INFRARED SPECTRA ILLUSTRATING THE SIMILAR LOSS OF ORGANIC AND INORGANIC CONSTITUENTS FROM FOG WATER COMPOSITES AND DISCRETE (SMALL VIALS) SAMPLES DURING STORAGE

(A) APPROXIMATELY 0.5 ml OF BOWKITE FOG WATER COMPOSITE, 4 AUG. 75, 1000 → 1100, IN FOG 4C, DRIED ON GERMANIUM PRISM AND ANALYZED AT SEA WITHIN THE HOUR OF COLLECTION. SEE TABLE 1 FOR COMPOSITIONAL DATA. CONDUCTIVITY MEASURED ABOARD SHIP WAS 240 $\mu\Omega^{-1}$/cm.

(B) SIMILAR ANALYSIS OF FOG 4C FOG WATER COMPOSITE, 4 AUG. 75, 0800 → 1400, AFTER RETURN TO LABORATORY. NOTE SIGNIFICANT LOSS OF ALL CONSTITUENTS FROM AQUEOUS PHASE.

(C) SIMILAR ANALYSIS OF DISCRETE SAMPLE OF FOG 4C (CALSPAN VIAL #41) FOG WATER AFTER RETURN TO LABORATORY. COMPARE COMPOSITIONAL DATA FOR THIS SAMPLE WITH THE ABOVE COMPOSITE, GIVEN IN TABLE 1.

(D) GELATINOUS RESIDUE FROM BOTTOM OF CALSPAN VIAL #41, ILLUSTRATING HIGH CONCENTRATION OF ORGANIC MATTER, WHICH WAS LOST FROM AQUEOUS PHASE DURING STORAGE, TOGETHER WITH ITS BOUND SALTS.



FOG 7, DISCRETE FOG WATER SAMPLE ANALYZED ABOARD SHIP, 6 AUG. 75

FOG 7, COMPOSITE FOG WATER SAMPLE ANALYZED ABOARD SHIP, 6 AUG. 75

FOG 7, COMPOSITE FOG WATER SAMPLE ANALYZED AFTER RETURN TO LABORATORY

SHIPBOARD ANALYSIS OF SPONTANEOUSLY SETTLED RESIDUE FROM FOG WATER, FOG 7, ACCUMULATED BY 8 AUG. 75

FOG 7, PRECIPITATE, AS ABOVE, LEACHED FREE OF SALTS WITH DISTILLED WATER

Figure 15 ADDITIONAL INFRARED SPECTRA ILLUSTRATING THE RAPID, SPONTANEOUS SEGREGATION OF ORGANIC MATTER AND SALTS FROM FOGWATER AFTER ITS COLLECTION AS AN ORIGINALLY CLEAR, HOMOGENEOUS SAMPLE

(A) APPROXIMATELY 0.5 ml OF FOG WATER FROM DISCRETE SAMPLE (CALSPAN VIAL #68, 0100, 6 AUG. 75) OF FOG 7, DRIED ON GERMANIUM PRISM, AND ANALYZED ABOARD SHIP. SEE TABLE 1 FOR COMPOSITIONAL DATA.

(B) SIMILAR ANALYSIS, ABOARD SHIP, OF FOG 7 WATER COMPOSITE (0100→0700, 6 AUG. 75), SEE TABLE 1 FOR COMPOSITIONAL DATA.

(C) SIMILAR ANALYSIS, AFTER RETURN TO LABORATORY OF FOG 7 WATER COMPOSITE (0130→0715, 6 AUG. 75). SEE TABLE 1 FOR COMPOSITIONAL DATA. NOTE SEVERE LOSS OF COMPONENTS COMPARED WITH FRESH SAMPLES.

(D) SPONTANEOUSLY SETTLED FLOCCULANT RESIDUE FROM FOG 7 WATER COMPOSITE (0130-0330, 6 AUG. 75), ANALYZED ABOARD SHIP ON 8 AUG. 75. PRIMARILY PROTEIN MATTER WITH BOUND INORGANIC CARBONATES, NITRATES, AND SULFATES IS PRESENT, ACCOUNTING FOR LOSSES FROM STORED SAMPLE.

(E) FLOCCULANT RESIDUE LEACHED FREE OF SALTS WITH DISTILLED WATER. ONLY ORGANICS REMAIN.

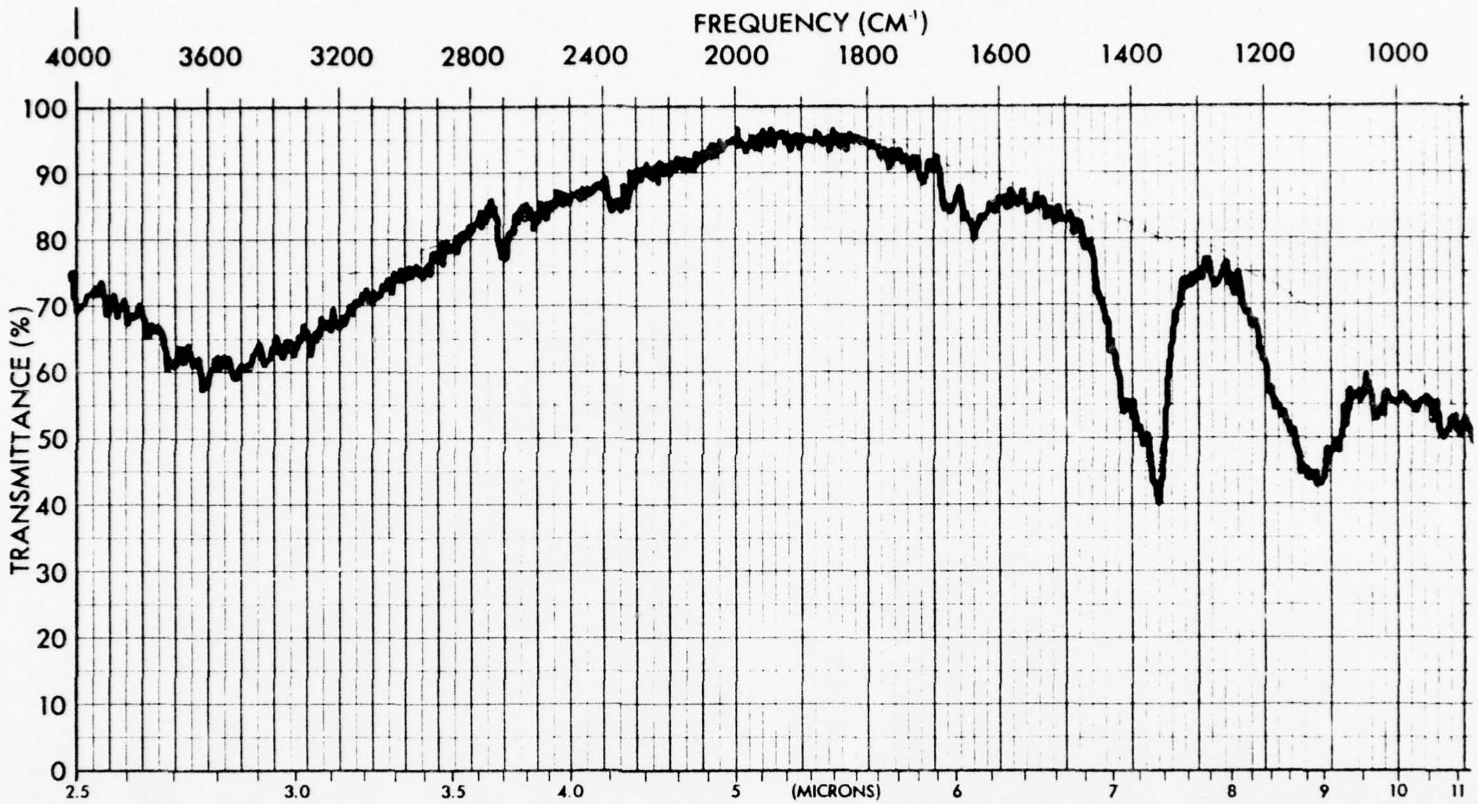
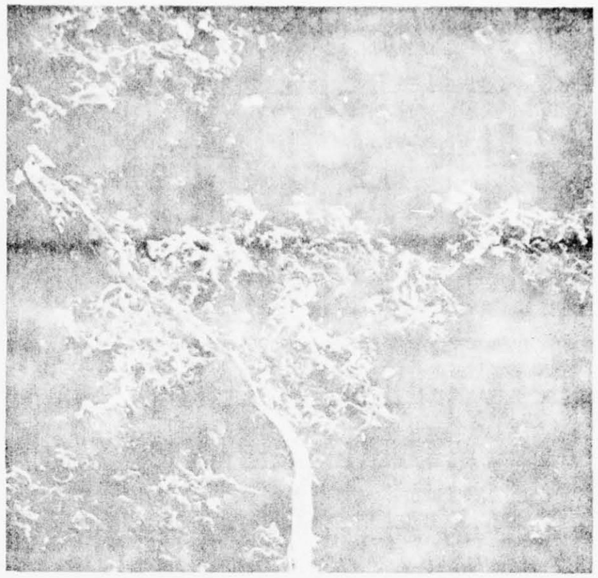
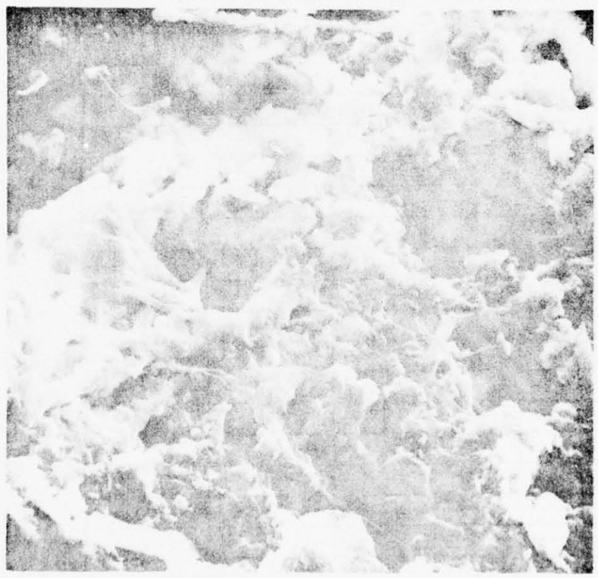


Figure 16 COMPARISON SPECTRUM, OBTAINED BY MULTIPLE ATTENUATED INTERNAL REFLECTION INFRARED SPECTROSCOPY, OF DEPOSIT FROM DRIED ALIQUOT (~ 0.5 mℓ) OF FOGWATER COMPOSITE OF DISCRETE SAMPLES FROM ALL INLAND FOGS AT TRAVIS AFB, CALIFORNIA, COLLECTED IN JANUARY 1973 AND RE-ANALYZED AFTER 3 YEARS OF STORAGE. EXCELLENT STABILITY OF THIS SAMPLE, AS CONTRASTED WITH NORTH ATLANTIC SEA FOG WATER COMPOSITES, IS NOTED. ALSO NOTE THE PRESENCE OF NITRATE AS A PRIMARY COMPONENT IN THE INLAND FOG SAMPLES.



SEM OF 3 AUG 75 SAMPLE OF SPONTANEOUS FOG WATER **PRECIPITATE**
(130X MAG, 45° TILT, 20 KV)



SEM OF 6 AUG 75 SAMPLE OF SPONTANEOUS FOG WATER **PRECIPITATE**
(1500X MAG, 45° TILT, 20 KV)

Figure 17

Table 2

AMBIENT AEROSOL SAMPLES

ESTIMATED CONCENTRATIONS OF INFRARED DETECTABLE SPECIES (IN $\mu g/M^3$ OF AIR SAMPLED BY BRESSAN IMPACTOR)

AEROSOL SAMPLE (EASTERN DAYLIGHT TIME)	DESCRIPTION	SULFATES	NITRATES	CARBONATES	N-H COMPOUNDS	NOTES
29 JULY 75 1313→1343	VISIBILITY ~ 6000M. CCN ≈ 2000/CM^3 @ 1% SUPERSATURATION. OFF NORTHEAST U.S. COAST, PROCEEDING TOWARD NOVA SCOTIA; ANALYZED ABOARD SHIP	25	32	57	87	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF COMPOSITE AEROSOL SAMPLE TAKEN IN HI-VOL UNIT, 29 JULY 75, 1200-2000, AT SAME SAMPLING LOCATION; HIGH SILICATE RESIDUE
2 AUG 75 1230→1330	CLEAR AND COLD; BRIGHT SUNSHINE CCN ≈ 500/CM^3 @ 1% S.S. RADON 222 ≈ 10 pCi/M^3. APPROACHING FOG 2. ANALYZED ABOARD SHIP.	3.88	4.5	7.4	9.7	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 2 AUG 75, 1030-1300. ALL OTHER CONCENTRATIONS REFERENCED TO THIS VALUE.
2 AUG 75 1535→1715	TWO HOURS BEFORE ENTERING FOG 2A. ANALYZED ABOARD SHIP.	3.8	4.9	8.3	10.6	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 2 AUG 75, 1530-1930. ALL OTHER CONCENTRATIONS REFERENCED TO THIS VALUE.
2 AUG 75 2105→2205	JUST COMING OUT OF FOG 2A, INTO WIND. APPARENT EDGE OF FOG FORMATION REGION. JUST PRIOR TO ENTRY OF FOG 2B.	4	0	6	10	ALL CONCENTRATIONS ESTIMATED FROM SPECTRAL INTENSITIES AND SAMPLING TIMES, BACK REFERENCED TO SO_4 – CONCENTRATIONS FOR SIMILAR SAMPLING PERIODS WHERE LABORATORY DATA WERE AVAILABLE.
3 AUG 75 1320→1405	JUST EXITING FOG 2C. VISIBILITY CHANGED FROM 2000M TO > 6000M DURING SAMPLING PERIOD.	4.42	3.2	6.3	9.1	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 3 AUG 75, 1230-1630.
4 AUG 75 1500→1530	BETWEEN FOGS 4C AND 4D, AT COURSE CHANGE TO RE-ENTER FOG BANK. APPARENT FOG FORMATION REGION. RADON 222 ≈ 4 pCi/M^3.	3.49	1.5	7.5	12.2	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 0930-1530, 4 AUG 75.
4 AUG 75 2035→2140	JUST OUT OF FOG 4D, CROSSWIND. VISIBILITY > 6000M. ROUGH SEA, AEROSOL SAMPLE APPEARED WET. RADON 222 ≈ 4 pCi/M^3.	4	1	6	12	ALL CONCENTRATIONS ESTIMATED FROM SPECTRAL INTENSITIES AND SAMPLING TIME. NO SILICATE RESIDUE.
4 AUG 75	VISIBILITY 2500M → 3000M DURING SAMPLE PERIOD, TERMINATED BY LIGHT RAIN. RADON 222 ≈ 4 pCi/M^3. APPROACHING FOG 6.	2	1	3	6	ALL CONCENTRATIONS ESTIMATED FROM SPECTRAL INTENSITIES AND SAMPLING TIME. SILICATE RESIDUE INCREASING.
5 AUG 75 1225→1345	ABOUT 2 HOURS AFTER LEAVING FOG 6. BRIGHT SUNSHINE, VISIBILITY > 6000M. CCN ≈ 2000/CM^3 @ 1% S.S.	6.65	2.8	9.5	16.6	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL COMPOSITE SAMPLE TAKEN 5 AUG 75, 1200-2000.
5 AUG 75 1600→1700	BRIGHT SUNSHINE WITH OCCASIONAL CLOUD SHADOWS. CCN ≈ 2000/CM^3 @ 1% S.S.	6.65	4.8	7.1	16.5	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 5 AUG 75, 1200-2000.
5 AUG 75 1800→1855	TOTALLY OVERCAST, VISIBILITY > 6000M. CCN ≈ 2000/CM^3 @ 1% S.S. APPROACHING FOG 7.	6.65	7.6	9.5	20.7	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 5 AUG 75, 1200-2000.
6 AUG 75 1030→1130	JUST EXITING FOG 8. VISIBILITY > 6000M. SUNNY THROUGH CLOUD COVER → GRAY OVERCAST.	3.25	3.1	6.2	10.8	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL COMPOSITE SAMPLE TAKEN 6 AUG 75, 1200-2020.
6 AUG 75 1300→1400	BRIGHT SUNSHINE, VISIBILITY > 6000M. SMOOTH SEA, MANY SLICKS. RADON 222 ≈ 10 pCi/M^3.	3.25	3.1	4.6	10.8	SO_4 – CONCENTRATION FROM LABORATORY ANALYSIS OF HI-VOL SAMPLE, 6 AUG 75, 1200-2020.

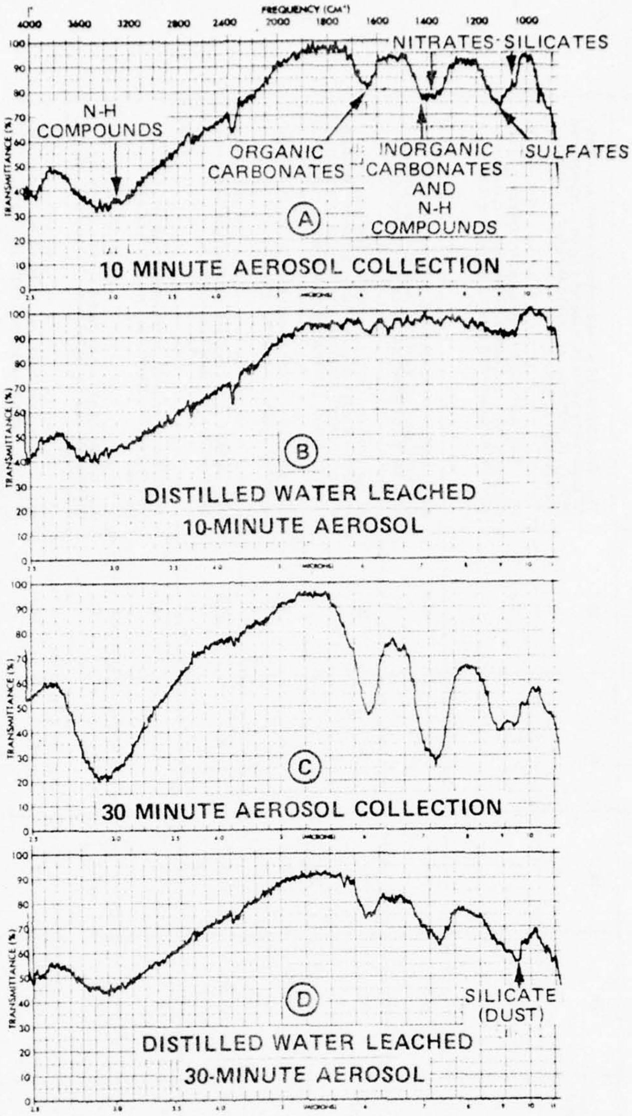


Figure 18 INTERNAL REFLECTION INFRARED SPECTRA OF TYPICAL NEAR-SHORE MARINE AEROSOLS, ANALYZED AS COLLECTED AT SEA, WITHIN MINUTES OF THEIR IMPACTION

(A) 28 JULY 75, 1316 → 1326, EASTERN DAYLIGHT TIME, PROCEEDING THROUGH CHESAPEAKE BAY BRIDGE-TUNNEL. APPROXIMATELY 480 CUBIC FEET OF AIR PASSED THROUGH SAMPLE IMPACTOR DURING THIS TIME.

(B) DISTILLED WATER LEACHED AEROSOL FROM CHESAPEAKE BAY, AS ABOVE. NOTE COMPLETENESS OF REMOVAL OF SOLUBLE COMPONENTS.

(C) 29 JULY 75, 1313 → 1343 EASTERN DAYLIGHT TIME, OFF NORTHEAST U.S. COAST, PROCEEDING TOWARD NOVA SCOTIA, CANADA. APPROXIMATELY 1440 CUBIC FEET OF AIR SAMPLED. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(D) DISTILLED WATER RINSED AEROSOL FROM NORTHEAST U.S. COAST, AS ABOVE. REMAINING ABSORPTION BANDS ILLUSTRATE PROTECTION OF COMPONENTS FROM DISSOLUTION BY HIGH PROPORTION OF (SILICATE) DUST IN ORIGINAL SAMPLE.

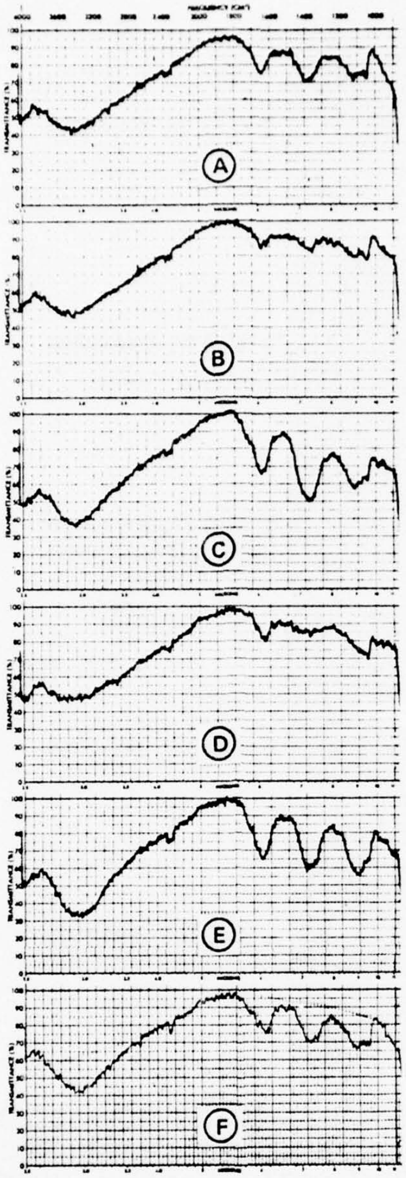


Figure 19 INTERNAL REFLECTION INFRARED SPECTRA CHARACTERIZING AMBIENT ATMOSPHERIC AEROSOLS IN APPARENT DISSIPATION REGIONS OF SEA FOGS ENCOUNTERED OFF NOVA SCOTIA, CANADA. NOTE PRESENCE OF HIGH CONCENTRATIONS OF CARBONATES, NITRATES, AND SULFATES IN THESE AEROSOLS

(A) IN CLEAR COLD AIR, APPROACHING FOG 2A, INTO WIND. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS

(B) SAME AS (A), BUT DISTILLED WATER LEACHED. NOTE PERSISTENCE OF SILICATE ABSORPTION BAND, INDICATING PRESENCE OF DUST IN AIR MASS.

(C) WITHIN 2 HOURS OF ENCOUNTERING FOG 2A. NOTE HIGH NITRATE CONTENT. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(D) SAME AS (C), DISTILLED WATER LEACHED. NOTE COMPLETENESS OF REMOVAL OF NITRATES, AND PERSISTENCE OF CARBONATES AND SILICATES.

(E) JUST OUTSIDE FOG 2C, VISIBILITY INCREASING FROM 2000 M TO > 6000M AS SAMPLE COLLECTION WAS IN PROGRESS. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(F) JUST LEAVING FOG 8, INTO WIND.

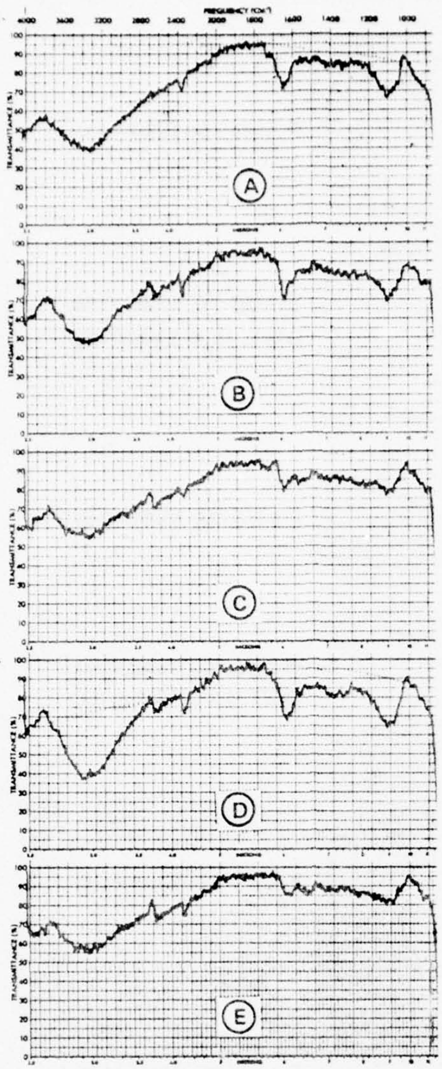


Figure 20 INTERNAL REFLECTION INFRARED SPECTRA CHARACTERIZING AMBIENT ATMOSPHERIC AEROSOLS IN APPARENT FORMATION REGIONS OF SEA FOGS ENCOUNTERED OFF NOVA SCOTIA, CANADA. NOTE SIGNIFICANT ABSENCE OF NITRATES AND HIGH PROPORTION OF ORGANIC MATTER IN THESE AEROSOLS

(A) JUST OUT OF FOG 2A, ABOUT TO ENTER FOG 2B AFTER REVERSAL OF SHIP DIRECTION. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(B) BETWEEN FOGS 4A AND 4B, IN APPARENT FOG FORMATION ZONE. VISIBILITY DEGRADED FROM > 6000M TO 4500M DURING SAMPLING, WHICH WAS TERMINATED WHEN PRE-FOG DRIZZLE WAS ENCOUNTERED.

(C) SAME AS (B), BUT DISTILLED WATER LEACHED. INSOLUBLE RESIDUE IS MAINLY ORGANIC (PROTEINACEOUS) MATTER.

(D) BETWEEN FOG 4C AND 4D, DURING SHIP COURSE CHANGE TO RE-ENTER FOG AT ITS FORMING EDGE. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(E) SAME AS (D), BUT DISTILLED WATER LEACHED. PRIMARILY ORGANIC MATTER REMAINING.

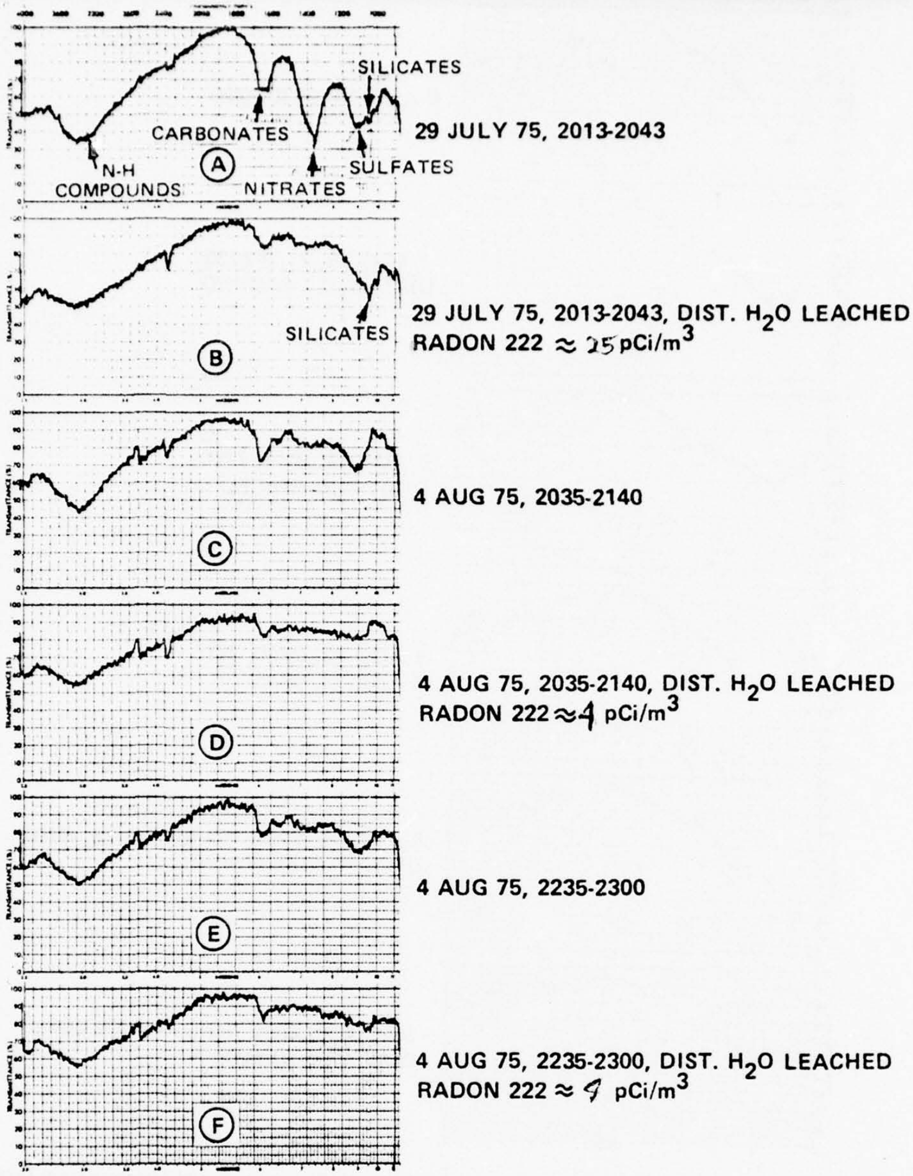


Figure 21 INTERNAL REFLECTION INFRARED SPECTRA RECORDED IN REAL-TIME, AT SEA, ILLUSTRATING COINCIDENCE OF SPECTRAL INDICATIONS FOR CONTINENTAL AEROSOLS WITH DATA FOR AIR MASS HISTORY GENERATED BY RADON 222 ANALYSES. RETENTION OF STRONG SILICATE ABSORPTION BAND AFTER WATER EXTRACTION OF THE IMPACTED AEROSOL CORRELATES WITH HIGH DUST (LAND ORIGIN) CONTENT. (NOTE: ALL RADON 222 DATA FROM R. LARSON, NRL)

(A) OFF NORTHEAST U.S. COAST, VISIBILITY ~ 4500M.

(B) SAME AS (A), AFTER DISTILLED WATER EXTRACTION. NOTE HIGH PROPORTION OF RESIDUAL SILICATE (DUST) MATERIAL.

(C) CLEAN MARINE AIR, VISIBILITY > 6000M. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(D) SAME AS (C), AFTER DISTILLED WATER EXTRACTION. NOTE ESSENTIAL ABSENCE OF SILICATE ABSORPTION BAND FROM SPECTRUM. ONLY HYDROPHILIC, BUT WATER INSOLUBLE, ORGANIC MATTER REMAINING, AS INDICATED BY "WETTABILITY" TESTS AT SEA.

(E) CONTINENTAL AIR MASS ENCOUNTERED AT SEA, VISIBILITY 2500M-3000M, APPROACHING FOG 6 FORMATION REGION. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

(F) SAME AS (E), BUT AFTER DISTILLED WATER EXTRACTION. NOTE EVIDENCE FOR RESIDUE OF SILICATES, INDICATING INCREASING DUST LOADING OF THIS AIR MASS. ORGANIC "CLADDING" OF AEROSOL SEEMED TO LIMIT ITS REMOVAL BY EVEN VIGOROUS WASHING.

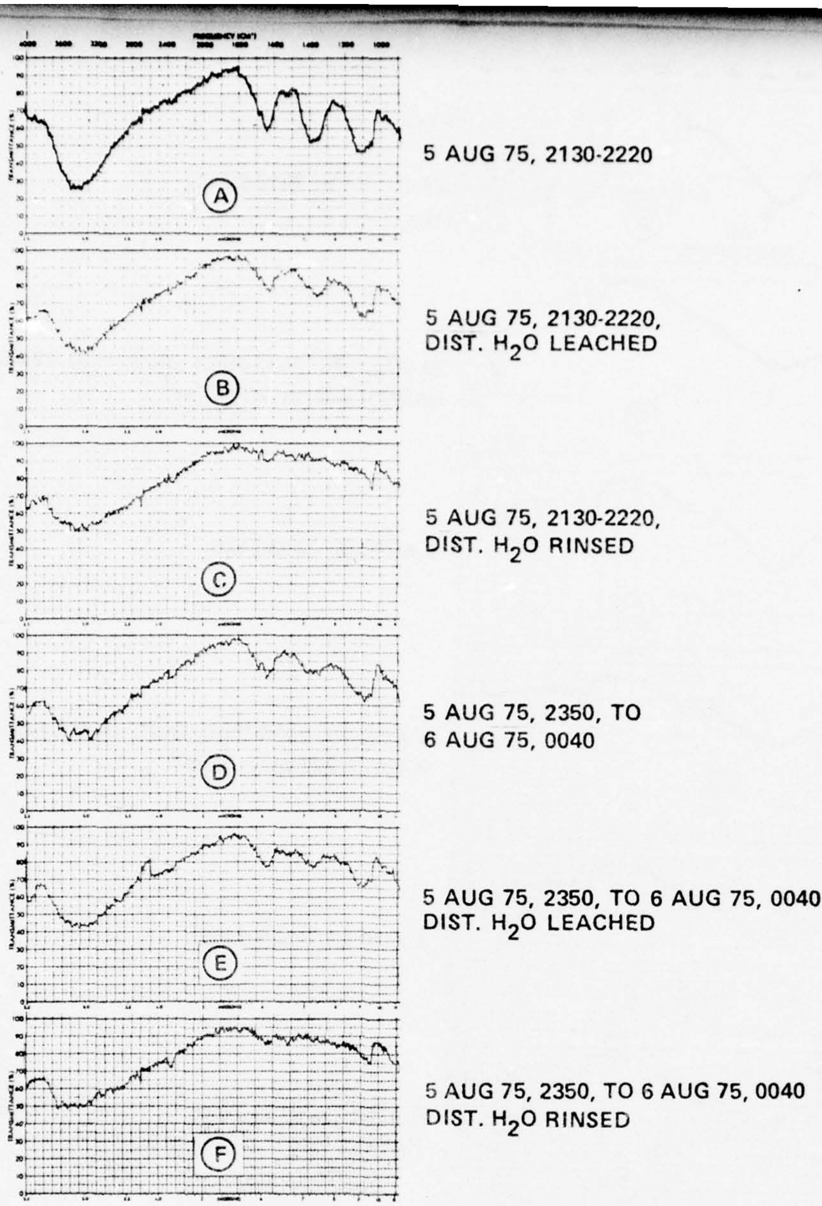


Figure 22 INTERNAL REFLECTION INFRARED SPECTRA OF AMBIENT MARINE AEROSOLS, COLLECTED IN THE SAME "RECENT CONTINENTAL" AIR MASS OVER COMPARABLE TIME PERIODS, ILLUSTRATING THAT SEA FOG FORMATION DOES NOT UTILIZE OR SCAVENGE SILICATE MATERIALS ("DUST") DURING ITS FORMATION. RADON 222 CONTENT WAS APPROXIMATELY 25 pCi/m^3 THROUGHOUT THIS PERIOD (DATA FROM R. LARSON, NRL). BOTH AEROSOL SPECIMENS WERE EXTREMELY RESISTANT TO WATER-DISSOLUTION, INDICATING HIGH DUST CONTENT, DESPITE OTHER MATERIALS ("SALTS") BEING ABOUT HALF THE PRE-FOG CONCENTRATION IN THE NEAR-FOG SAMPLE.

A, B, C AEROSOL SAMPLE FROM "RECENT CONTINENTAL" AIR MASS, ABOUT 3 HOURS PRIOR TO ENCOUNTERING FOG 7E. VISIBILITY > 6000M.

D, E, F AEROSOL SAMPLE FROM SAME AIR MASS, AS FOG 7E WAS ENTERED CROSSWIND. NOTE THAT CARBONATE, NITRATE, AND SULFATE MATERIAL WAS ABOUT THE SAME AS IN PRE-FOG SAMPLE, AFTER ITS BRIEF CONTACT WITH DISTILLED WATER.

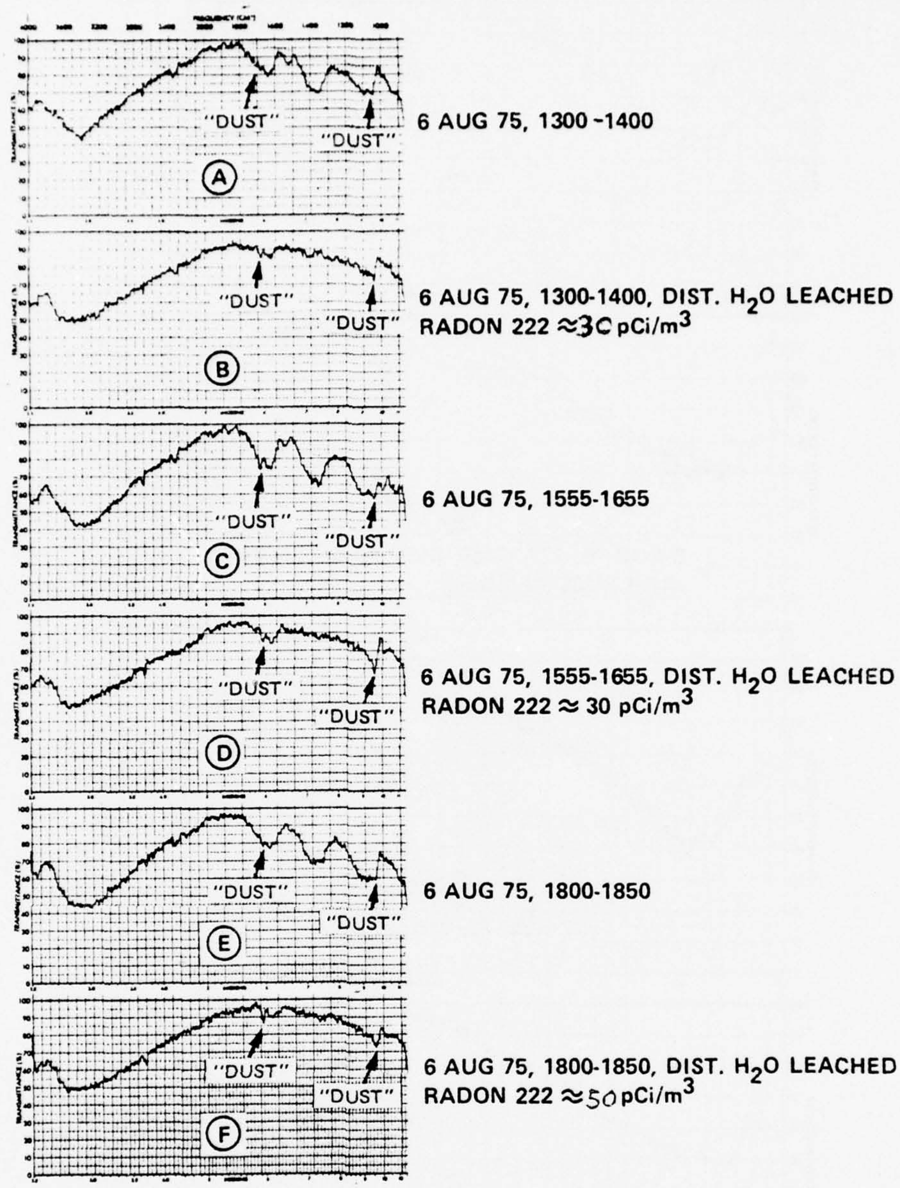


Figure 23 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA WITHIN MINUTES OF AEROSOL COLLECTION, CONFIRMING SHIP'S ENCOUNTER WITH AND WITHDRAWAL FROM DUST-LADEN AIR MASS, AS INDICATED INDEPENDENTLY (DATA OF R. LARSON, NRL) BY RADON 222 COUNTS OVER SAME TIME PERIODS.

Ⓐ, Ⓑ VISIBILITY > 6000M, BRIGHT SUNSHINE, SMOOTH SEA, MANY SLICKS. SHIP HEADING SW. SEE TABLE 2 FOR COMPOSITIONAL ANALYSIS.

Ⓒ, Ⓓ VISIBILITY > 6000M, OVERCAST. APPARENT EDGE OF RECENT CONTINENTAL AIR INCURSION, AS INDICATED BY HIGH DUST CONTENT OF IMPACTED AEROSOL. SHIP HEADING N, AT CLOSEST POINT OF APPROACH TO CAPE BRETON ISLAND.

Ⓔ, Ⓕ VISIBILITY > 6000M, SUNSET NOTED BENEATH HIGH OVERCAST DURING THIS SAMPLING PERIOD. SHIP'S COURSE REVERSED TO NE JUST PRIOR TO AEROSOL COLLECTION, STEAMING BACK TOWARDS MARINE AIR MASS.

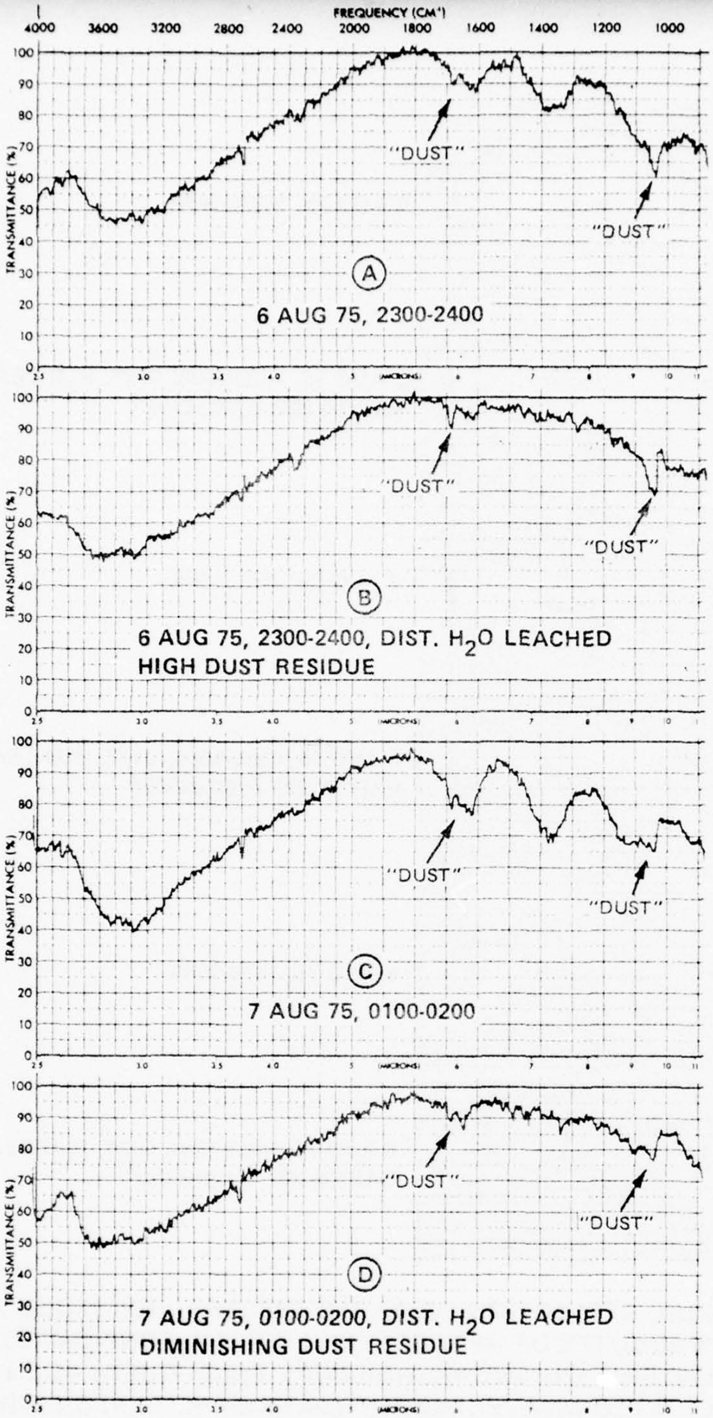


Figure 24 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA WITHIN MINUTES OF AEROSOL COLLECTION, DEPICTING AN ENCOUNTER WITH A "TONGUE" OF DUST-LADEN AIR WHICH WAS NOT CONFIRMED BY SIMULTANEOUS RADON 222 COUNTS. DATA OF R. LARSON, NRL, SHOWS RADON 222 ≈ 15 pCi/m^3 THROUGHOUT THIS ENTIRE SAMPLING PERIOD. VISIBILITY WAS > 6000M AND SEAS WERE CALM DURING BOTH SEQUENCES OF AEROSOL IMPACTION.

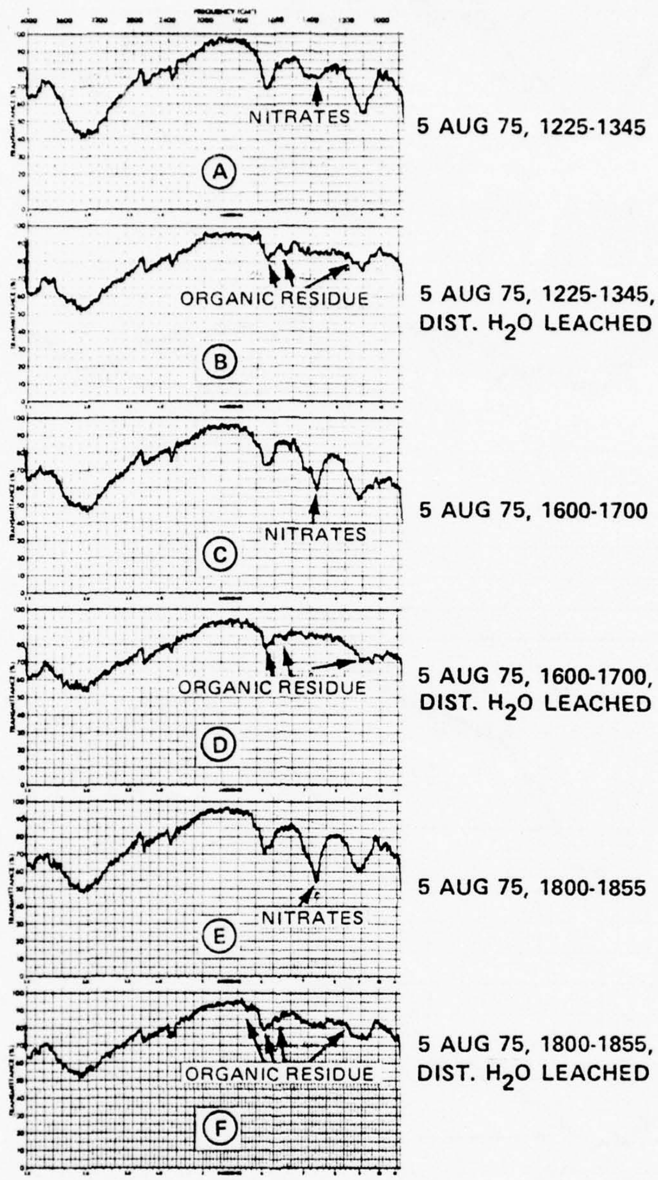


Figure 25 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED ABOARD SHIP AS AEROSOL SPECIMENS WERE COLLECTED, ILLUSTRATING THE BUILDUP OF NITRATE COMPONENTS IN CLEAR AMBIENT AIR MASS WITH CONTINUED IRRADIATION TIME. SHIP HEADING NE, PARALLEL TO NOVA SCOTIA, CANADA, COAST LINE THROUGHOUT THESE SAMPLING PERIODS. CONDENSATION NUCLEI COUNT REMAINED AT ABOUT $2000/CM^3$ AT 1% SUPERSATURATION DURING THIS TIME. SEE TABLE 2 FOR COMPOSITIONAL ANALYSES.

A, B VISIBILITY > 6000M, BRIGHT SUNSHINE.

C, D VISIBILITY 3000M → 6000M DURING SAMPLING PERIOD, BRIGHT SUNSHINE WITH OCCASIONAL CLOUD SHADOWS.

E, F VISIBILITY > 6000M, TOTALLY OVERCAST.

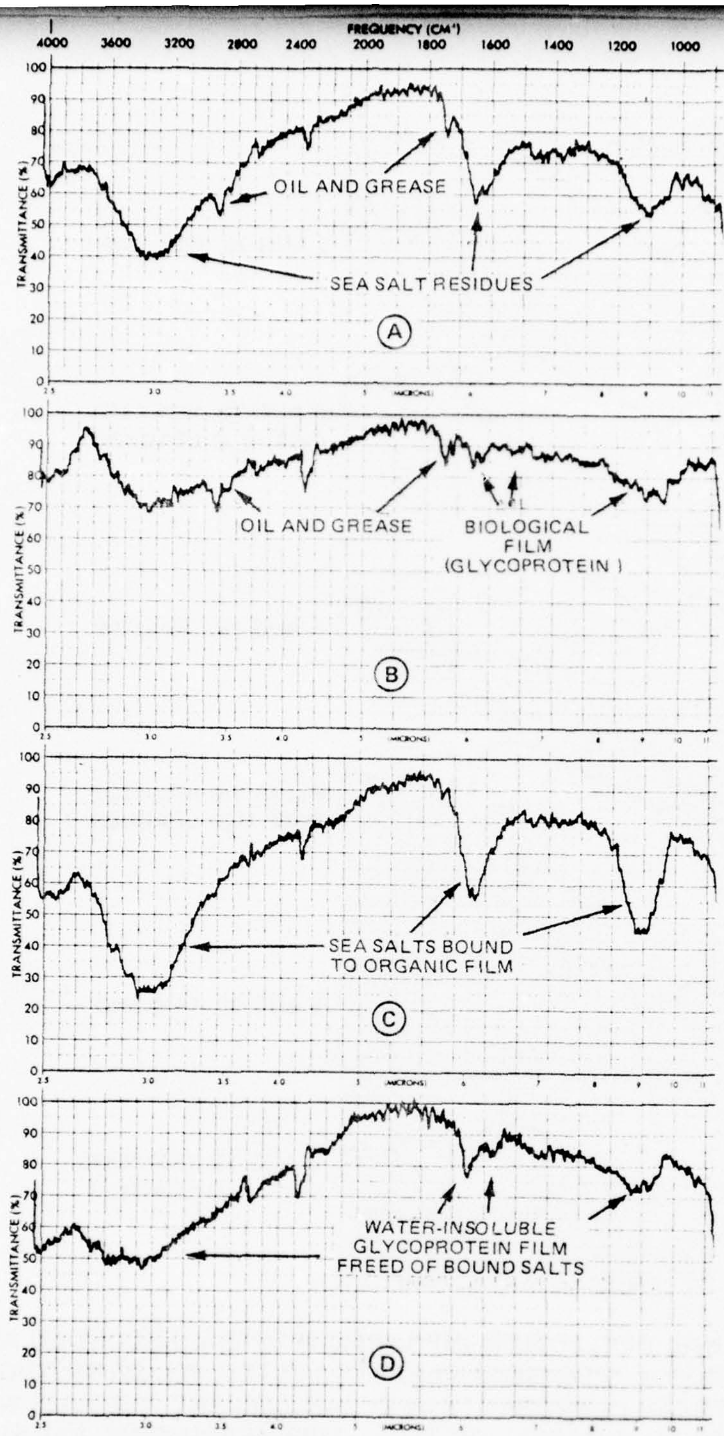
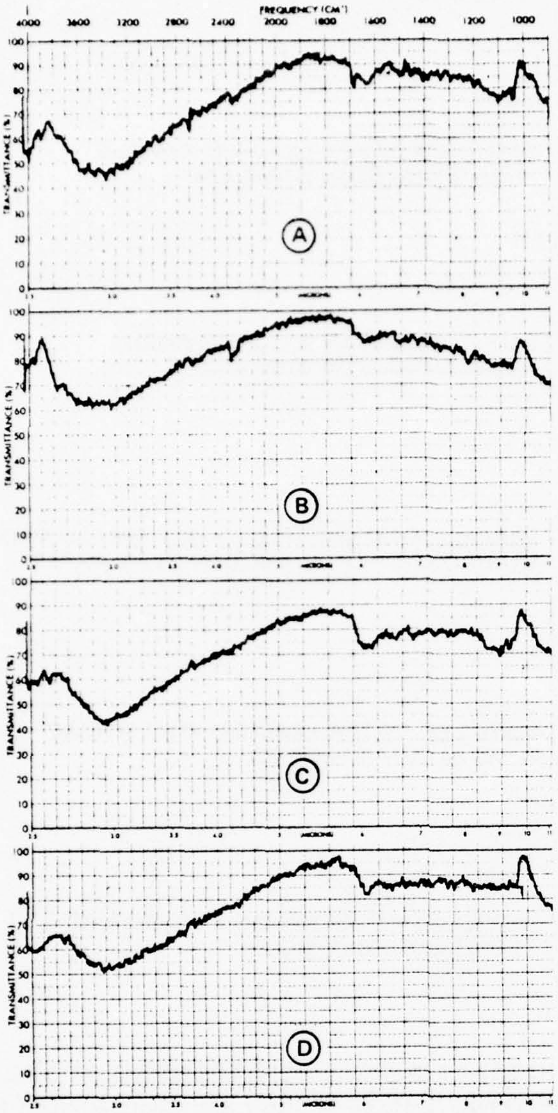


Figure 26 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED ABOARD SHIP, OF POLLUTANT SURFACE FILM SAMPLES RETRIEVED BY THE "PRISM DIP" TECHNIQUE AT THE NORFOLK NAVY BASE FUEL PIER, 28 JULY 1975

(A), (C) SAMPLES ANALYZED "AS-TAKEN," INCLUDING BOUND SEA SALTS TRANSFERRED WITH ORGANIC SURFACE FILM

(B), (D) SAME SAMPLES, AFTER LEACHING AWAY OF SOLUBLE SALTS WITH DISTILLED WATER.



30 JULY 75, 0930

1 AUG 75, 2200

2 AUG 75, 0020

2 AUG 75, 0020, DIST. H_2O RINSED

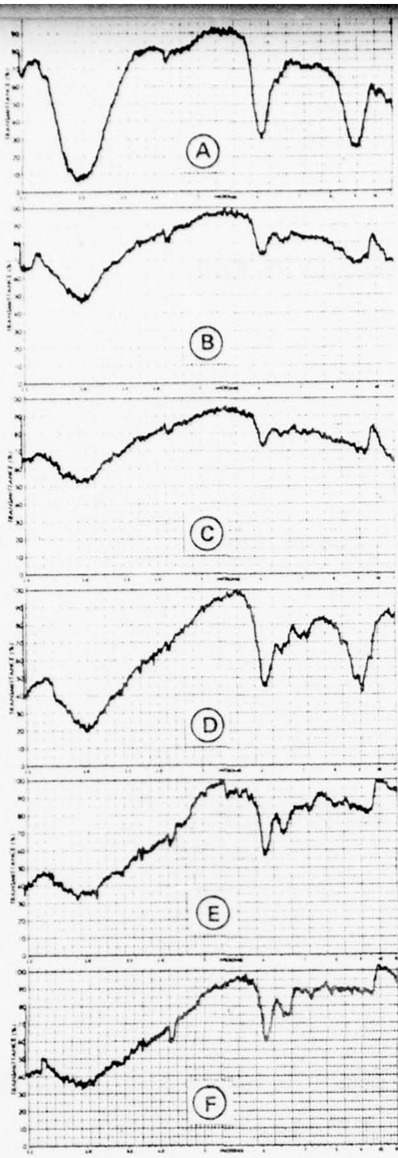
Figure 27 INTERNAL REFLECTION INFRARED SPECTRA, OBTAINED AT SEA, OF TYPICAL SURFACE FILMS OCCUPYING OBVIOUSLY "SLICKED" REGIONS OF THE NORTHWEST ATLANTIC OCEAN, OFF NOVA SCOTIA, CANADA. SPECIMENS RETRIEVED BY "PRISM-DIP" TECHNIQUE.

(A) IN MIDST OF LARGE CIRCULAR SLICK, ABOUT 1 MILE IN DIAMETER, WITH FLOATING SARGASSUM WEED SEGMENTS IN ITS CENTER. SEA SURFACE TENSION DETERMINED WITH "SPREADING OIL" WAS APPROXIMATELY 56 DYNES/CM.

(B) BANDED SEA SLICK ZONE WITH *FUCUS (KELP) SEGMENTS DISPERSED WITHIN IT.* SEA SURFACE TENSION ~ 69 DYNES/CM.

(C) LARGE SEA SLICK, EXHIBITING COMPLETE DAMPING OF CAPILLARY RIPPLES. DARKNESS PREVENTED SIGHTING OF ANY OBVIOUS SLICK SOURCE, SUCH AS SEAWEEDS. SEA SURFACE TENSION ~ 57 DYNES/CM.

(D) SAME FILM AS (C), BUT AFTER VIGOROUS DISTILLED WATER RINSING. NOTE LOSS OF WATER-SOLUBLE (APPARENTLY SULFONATED POLYSACCHARIDE) COMPONENTS.



SARGASSUM WEED
DRAINAGE WATER

DISTILLED WATER LEACHED RESIDUE
FROM SARGASSUM DRAINAGE

DISTILLED WATER RINSED RESIDUE
FROM SARGASSUM DRAINAGE

SURFACE FILM SPONTANEOUSLY SPREAD FROM
SARGASSUM WEED OVER DISTILLED WATER

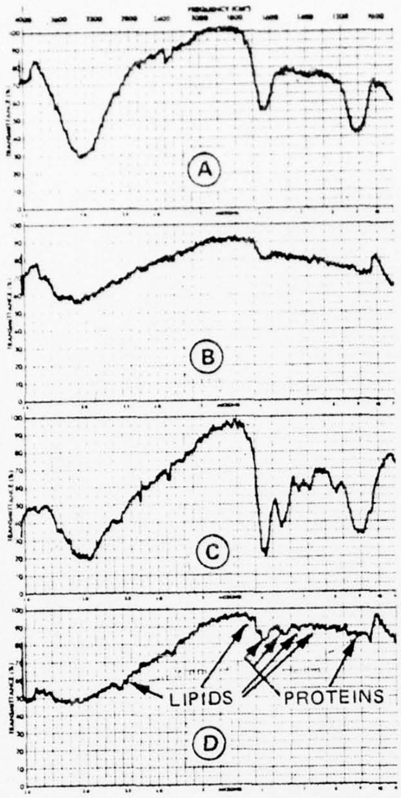
DISTILLED WATER LEACHED FILM SPREAD
FROM SARGASSUM WEED

DISTILLED WATER RINSED FILM SPREAD
FROM SARGASSUM WEED

Figure 28 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA WITH FRESH SAMPLES, DOCUMENTING THE EFFICACY OF SARGASSUM SEA-WEED EXUDATES AS POTENT SEA-SLICK FORMERS. THE WATER-INSOLUBLE, SURFACE-ACTIVE COMPONENT RESPONSIBLE FOR SLICK FORMATION IS APPARENTLY A REASONABLY PURE PROTEIN.

A, B, C 30 JULY 1975, 0950. FRESHLY SNAGGED SARGASSUM WEED FROM CENTER OF LARGE SEA SLICK, ANALYZED ABOARD SHIP FOR COMPONENTS GIVING RISE TO SLICKS OBSERVED.

D, E, F 30 JULY 1975, 1205. ADDITIONAL SAMPLE OF FRESHLY SNAGGED SARGASSUM WEED FROM "SLICKED" REGION OF NORTHWEST ATLANTIC OCEAN, TOUCHED TO CLEAN DISTILLED WATER SURFACE IN SHIPBOARD "LANGMUIR TROUGH" AND THE SURFACE FILM SAMPLED. THIS FILM EXHIBITED AN EQUILIBRIUM SPREADING PRESSURE ON CLEAN SEAWATER (EQUIVALENT TO SEA SURFACE TENSION DEPRESSION) OF ABOUT 37 DYNES/CM. ACTUAL SEA SURFACE TENSION DEPRESSIONS MEASURED ARE LESS THAN THIS, BECAUSE THE "UNBOUNDED" OCEAN SURFACE ALLOWS CONTINUOUS FILM SPREADING UNTIL THE SURFACE-ACTIVE AGENT IS DEPLETED.



KELP-SPAWNED SURFACE FILM, AS FORMED

DISTILLED WATER LEACHED FILM FROM KELP

SURFACE FILM FROM JELLY FISH

SURFACE FILM FROM "DISRUPTED" PLANKTON

Figure 29 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA WITH FRESH SAMPLES, OF SURFACE-FILM-FORMING BIOLOGICAL MATERIALS WHICH CAN GIVE RISE TO SEA SLICKS, IN ADDITION TO SARGASSUM WEED

A, B — 31 JULY 1975, 1300. FRESHLY-SNAGGED KELP (FUCUS) FLOTATION STRANDS FROM "SLICKED" REGION OF THE NORTHWEST ATLANTIC OCEAN, TOUCHED TO CLEAN DISTILLED WATER SURFACE. DISSOLUTION OF MOST OF THE FILM COMPONENTS EXUDED INDICATES THAT SURFACE-ACTIVITY EXHIBITED IS DUE MAINLY TO WATER-INSOLUBLE PROTEIN COMPONENTS PRESENT IN MINOR PROPORTION. EQUILIBRIUM SPREADING PRESSURE FOR THESE COMPONENTS, DETERMINED IN SHIPBOARD "LANGMUIR TROUGH," WAS APPROXIMATELY 17 DYNES/CM. SIMILAR SAMPLE ACQUIRED ON 7 AUG 75, 2030, GAVE SPREADING PRESSURE OF ONLY 12 DYNES/CM, REFLECTING DEPLETION OF SURFACE-ACTIVE COMPONENTS DURING LONGER RESIDENCE AT SEA. ALL COASTAL KELP FRAGMENTS OBSERVED AT SEA WERE APPARENTLY DERIVED FROM ACTIVITY OF HURRICANE BLANCHE, WHICH REACHED NOVA SCOTIA, CANADA, ABOUT 10 DAYS PRIOR TO VOYAGE. BUBBLE STABILITY IN FROTH PATCHES IN KELP-SPAWNED SLICKS WAS ABOUT 20 SECONDS.

C — 30 JULY 1975, FRESHLY SNAGGED JELLY FISH FORMED SURFACE FILM ON CLEAN DISTILLED WATER WITH EQUILIBRIUM SPREADING PRESSURE OF 5 DYNES/CM. PROBABLY A MINOR SOURCE OF NATURAL SEA SLICKS.

D — 2 AUG 1875, FRESH PLANKTON TOW FORMED SURFACE FILM ON CLEAN DISTILLED WATER WITH EQUILIBRIUM SPREADING PRESSURE OF 5 DYNES/CM. SHAKING THE SAMPLE, DISPERSED IN SEAWATER, TO SIMULATE WHITE CAP CONDITIONS, DISRUPTED THE ORGANISMS SUFFICIENTLY TO FORM A SURFACE FILM WITH 9 DYNES/CM EQUILIBRIUM SPREADING PRESSURE. NOTE MINOR ABSORPTION BANDS FOR LIPOIDAL MATERIALS (FATTY ACIDS AND ESTERS) IN THIS SPECTRUM, PROBABLY REFLECTING THE PRESENCE OF COMPONENTS EXTRACTED BY ORGANIC SOLVENTS FROM SEA-SURFACE FILM SAMPLES BY OTHER WORKERS.

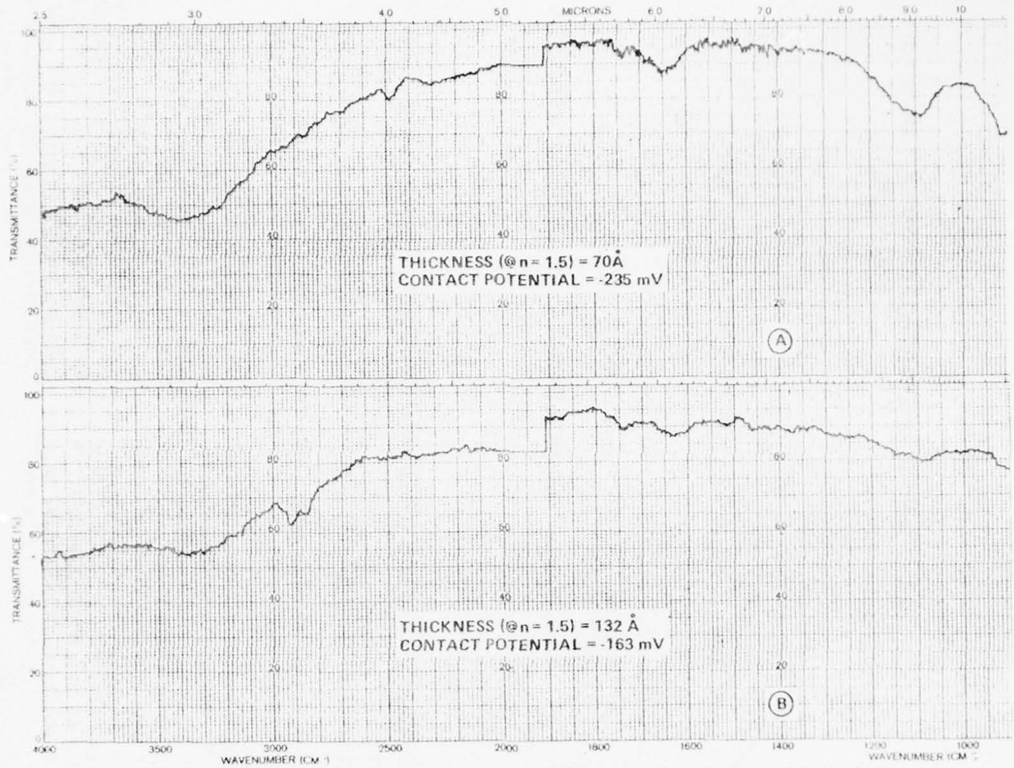
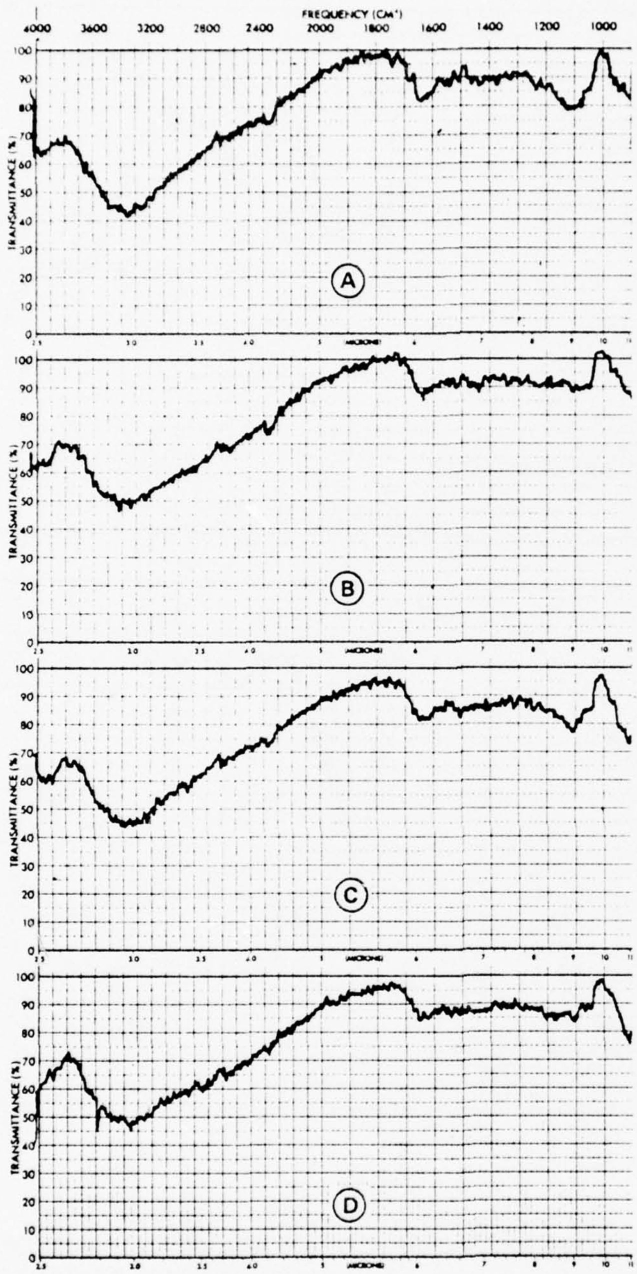


Figure 30 LABORATORY-RECORDED ANALYTICAL SPECTRA, THICKNESS (DETERMINED BY ELLIPSOMETRY), AND SURFACE POTENTIAL (DETERMINED BY VIBRATING REED ELECTROMETER CIRCUIT) CHARACTERIZING SEA SURFACE FILMS IN PLACE UPON THE GERMANIUM PRISMS USED TO RETRIEVE THEM.

(A) 12 AUG 75, 1000, HALIFAX, NOVA SCOTIA, CANADA, OUTER HARBOR

(B) 12 AUG 75, 2240, HALIFAX, NOVA SCOTIA, CANADA, HARBOR, FIRST SUBMARINE SQUADRON PIER



~2200 JET DROPS, RESIDUE

~2200 JET DROPS, DISTILLED WATER LEACHED RESIDUE

~900 JET DROPS, RESIDUE

~900 JET DROPS, DISTILLED WATER LEACHED RESIDUE

Figure 31 INTERNAL REFLECTION INFRARED SPECTRA OF SALT AND ORGANIC MATTER EJECTED WITH JET DROPLETS FROM SMALL BUBBLES BURSTING AT CLEAN (OVERFLOWING) SURFACE OF SEAWATER. BUBBLE-BREAKING EXPERIMENTS PERFORMED ABOARD SHIP (BY DUNCAN BLANCHARD, ON 5 AUG 1975) WITH FRESH SEAWATER.

A, B BUBBLE AGED ABOUT ONE SECOND, BEFORE REACHING SURFACE.
C, D BUBBLE AGED 30-40 SECONDS BEFORE REACHING SURFACE.

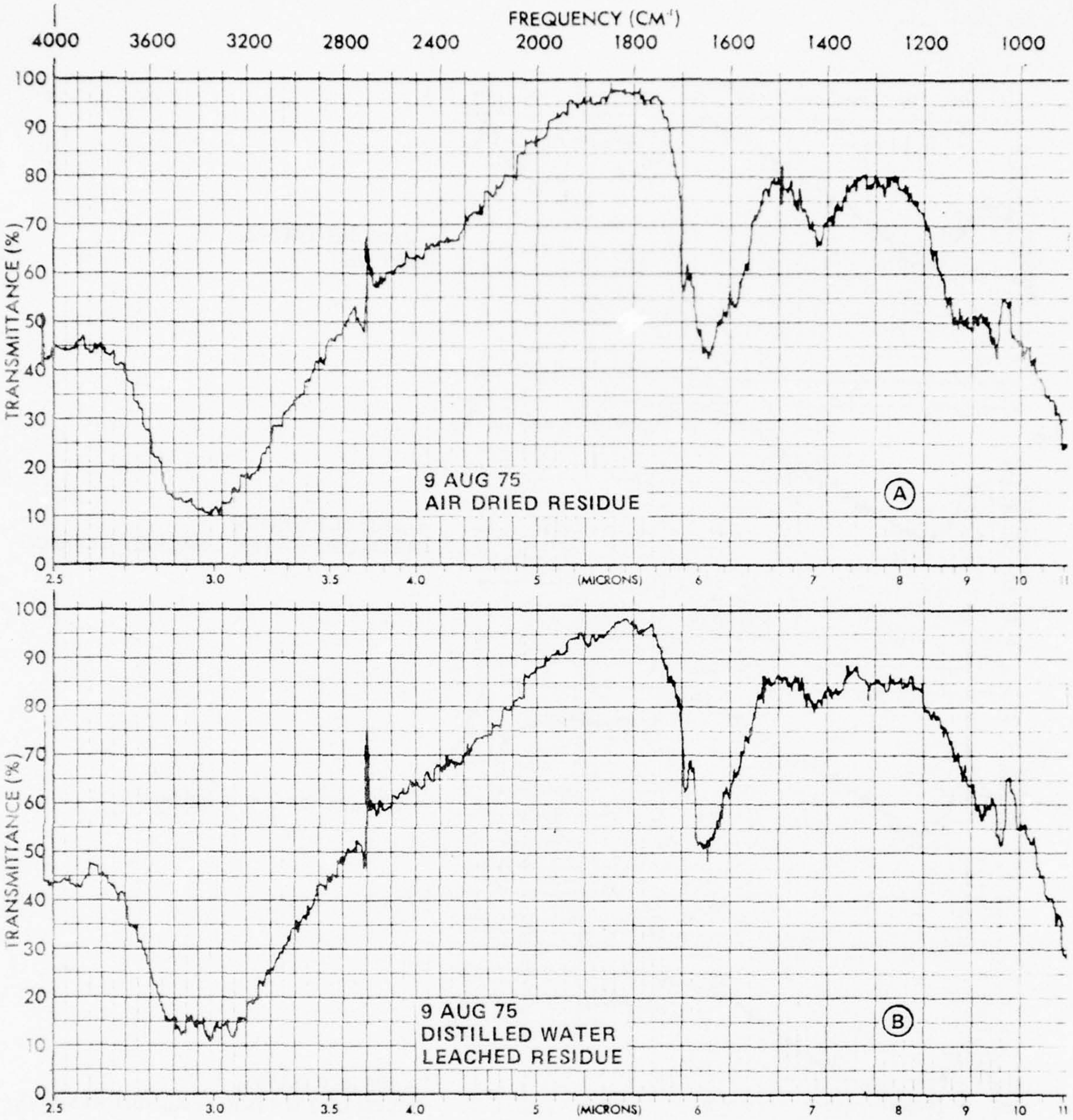


Figure 32 INTERNAL REFLECTION INFRARED SPECTRA OF AN ABUNDANT CARBONATE (PROBABLY ORGANICALLY-STABILIZED) SCALE FORMED UPON DESICCATION OF A WATER ALIQUOT FROM THE SUPPLY RECIRCULATED THROUGH THE UNIVERSITY OF MISSOURI NUCLEI COUNTER FOR 2 WEEKS. SAMPLE PROVIDED BY D. ALOFS.

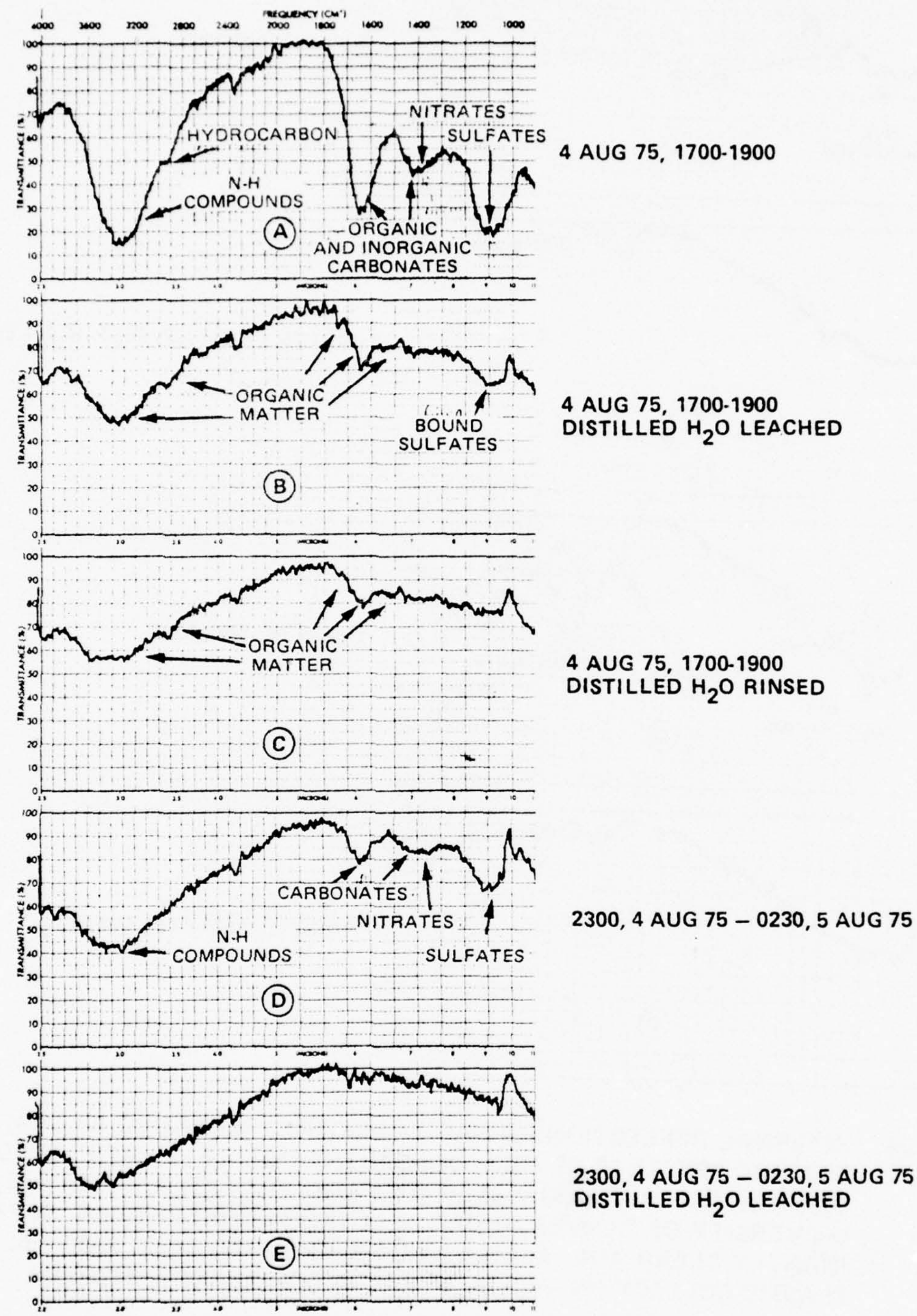


Figure 33 INTERNAL REFLECTION INFRARED SPECTRA OF MARINE RAIN RESIDUES, ANALYZED ABOARD SHIP WITHIN THE HOUR OF SAMPLE COLLECTION

Ⓐ, Ⓑ, Ⓒ EARLY RAIN, VERY HIGHLY CONCENTRATED IN BOTH INORGANIC SALTS AND ORGANIC MATTER.

Ⓓ, Ⓔ MATURE RAIN, HEAVY PRECIPITATION, LESS CONCENTRATED IN SALTS AND ALMOST FREE OF ORGANIC MATTER.

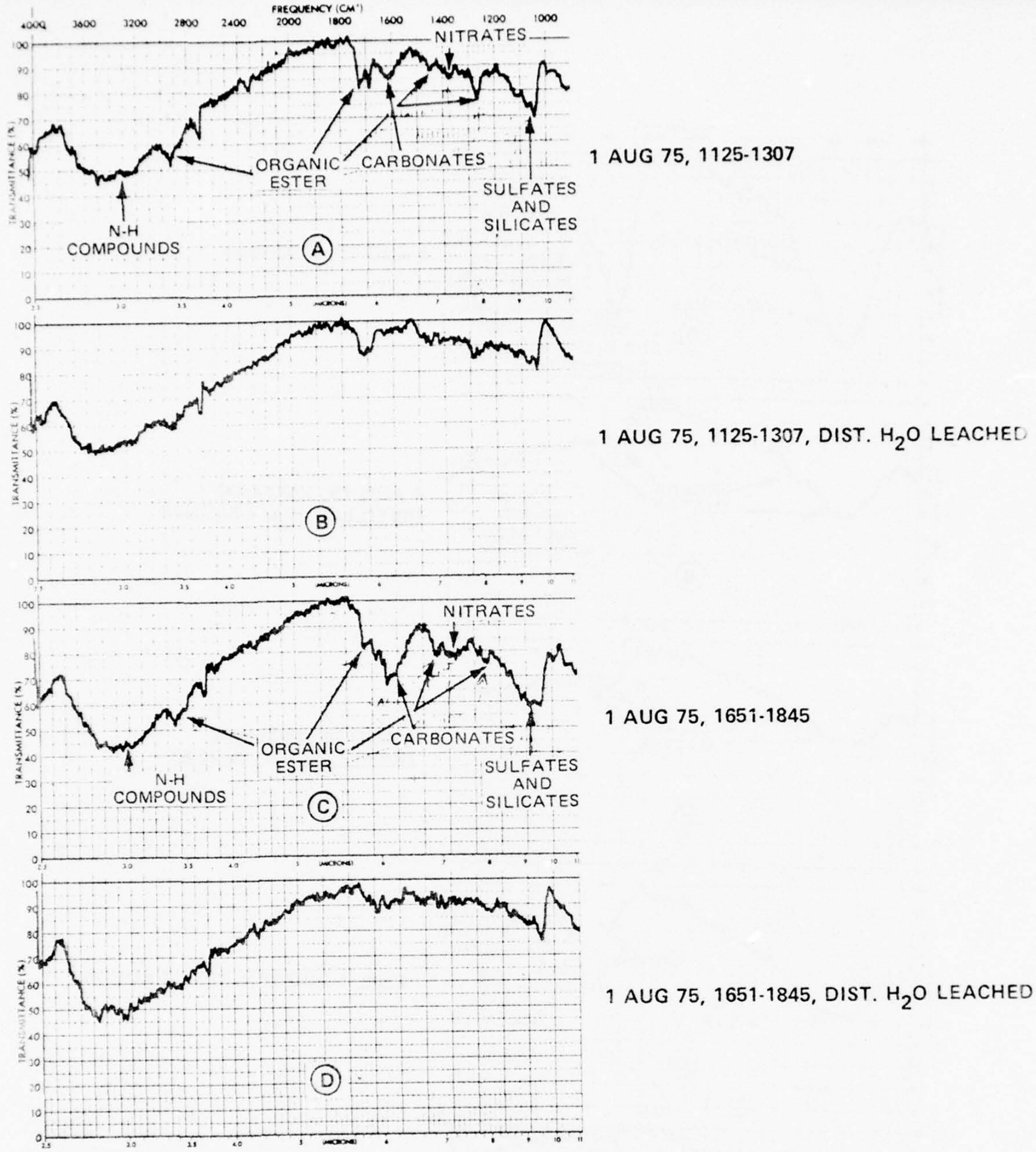
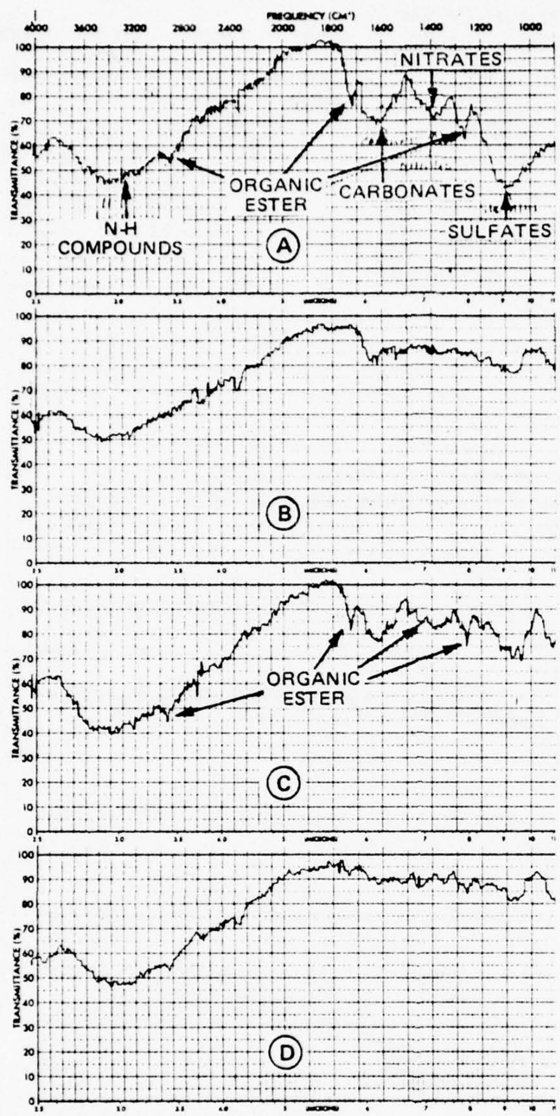


Figure 34 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA, ILLUSTRATING PRESENCE OF HIGH CONCENTRATION OF A WATER-SOLUBLE ORGANIC ESTER IN FOG WATER SAMPLES COLLECTED FROM THE UNIVERSITY OF DENVER NUCLEI SPECTROMETER CHAMBER, IN PREDOMINANTLY CLEAR AIR. ALL SPECIMENS PROVIDED BY V. SAXENA. GLASS/PLASTIC COLLECTION VESSEL UTILIZED FOR THESE SPECIMENS.

A, B CHAMBER OPERATED AT MAXIMUM SUPERSATURATION.
C, D CHAMBER OPERATED AT MINIMUM SUPERSATURATION.



7 AUG 75, 1435-1635

7 AUG 75, 1435-1635, DIST. H_2O LEACHED

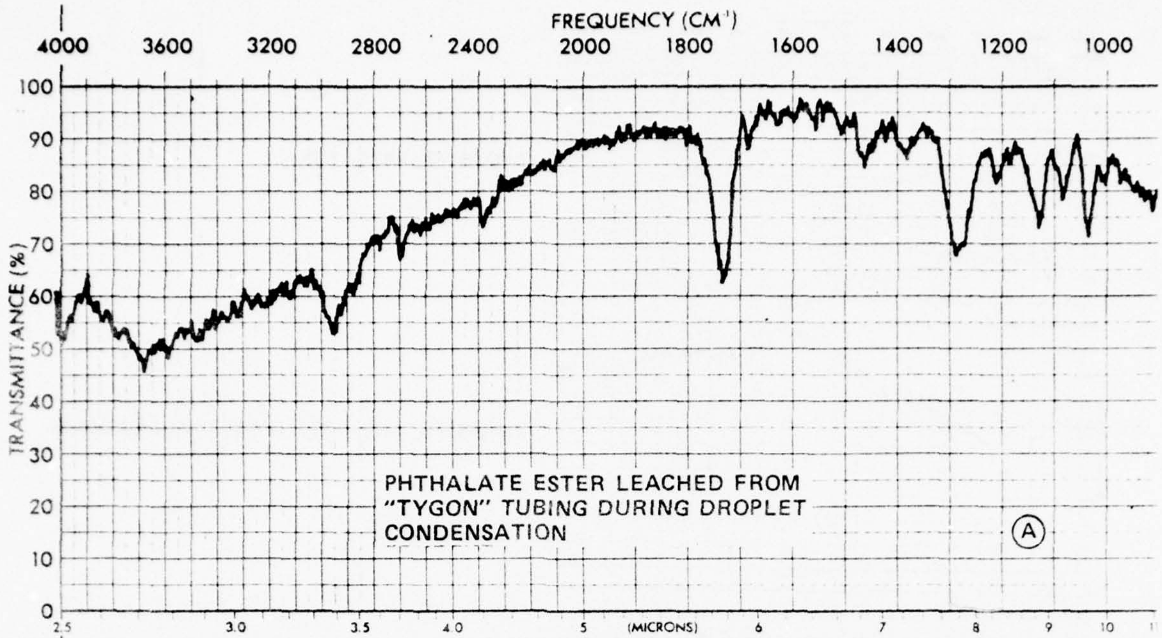
9 AUG 75, 1317-1520

9 AUG 75, 1317-1520, DIST. H_2O LEACHED

Figure 35 INTERNAL REFLECTION INFRARED SPECTRA, RECORDED AT SEA, CONFIRMING THE PRESENCE OF HIGH CONCENTRATION OF ORGANIC ESTER (WATER-SOLUBLE) IN FOG WATER SAMPLES FROM UNIVERSITY OF DENVER NUCLEI SPECTROMETER CHAMBER, OPERATING IN SEA-FOG-FORMING AIR MASS. ALL SPECIMENS PROVIDED BY V. SAXENA. ALL GLASS COLLECTION VESSEL UTILIZED FOR THESE SPECIMENS. SAMPLE ANALYSES DID NOT CHANGE WHEN FOG WATER RESIDUES WERE ALLOWED TO DRY, OR SUBLIMATE, FOR AN ADDITIONAL 24 HOURS AFTER THE FIRST SPECTRUM DETERMINED. THE FOG WATER RESIDUES DID SHOW DEFINITE SURFACE ACTIVITY, EASILY FORMING SURFACE FILMS ON CLEAN DISTILLED WATER AGAINST A "PISTON FILM" OF 5 DYNES/CM EQUILIBRIUM SPREADING PRESSURE

A, B CHAMBER OPERATED AT MINIMUM SUPERSATURATION, APPROACHING FOG 10.

C, D CHAMBER OPERATED AT MAXIMUM SUPERSATURATION, APPROACHING FOG 12 (APPARENTLY SAME FOG BANK AS FOG 10).



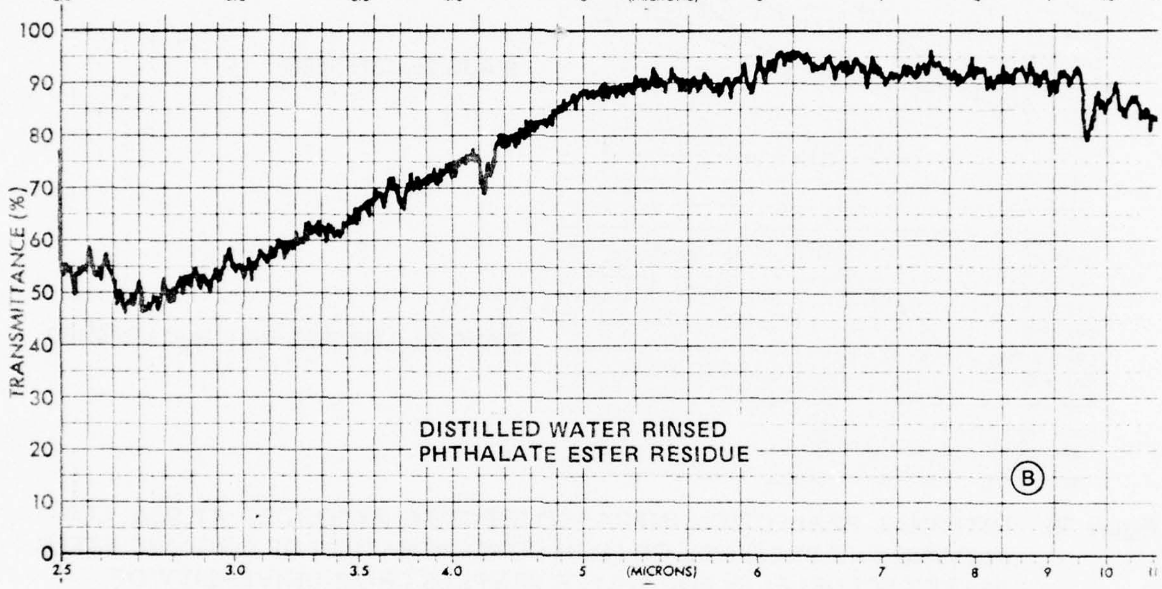


Figure 36 INTERNAL REFLECTION INFRARED SPECTRA, OBTAINED IN THE LABORATORY, REVEALING THE PROBABLE SOURCE OF THE ORGANIC ESTER COLLECTED WITH FOG WATER SAMPLES FROM THE UNIVERSITY OF DENVER NUCLEI SPECTROMETER CHAMBER. LONG-TERM (48 HOUR) EXTRACTION OF "TYGON" BRAND PLASTIC TUBING IN COOL DISTILLED WATER DOES NOT LEAD TO EXTRACTION OF ITS PHTHALATE ESTER, BUT CONDENSATION OF WATER UPON THE TUBING'S INNER SURFACE DOES LEAD TO EFFICIENT EXTRACTION OF THIS MATERIAL

NH_4 and CO Analysis of Air Samples Collected
During USNS Hayes Cruise
July and August, 1975

R. A. Lamontagne
U. S. Naval Research Laboratory

The method of analysis was done using a modified version of the gas chromatographic technique of Swinnerton et al (1962a,b) and Swinnerton & Linnenbom (1967). A 100 ml sample is concentrated in a cold trap (allowing N_2, O_2, and CO_2 to be separated from the CO and CH_4), and subsequently heated and backflushed onto a 1.5 meter 5Å molecular sieve column for separation. Carbon monoxide is converted to methane by passing over a nickel catalyst before being introduced to the flame ionization detector. Using this size sampling loop, the lower limit of detection is ≈ 10 ppb.

Table 1 shows the results of the fourteen samples collected. They have been grouped into three sections: 1) fog areas; 2) non-fog areas; and 3) non-fog high value. The reason for the first two groups is obvious. It was felt that the carbon monoxide values in samples #1 and 25 were much too large for open ocean conditions and are probably the result of contamination even though the methane values are not exceedingly high; thus the reason for the third group. Average northern hemisphere methane and carbon monoxide concentrations are 1.50 ppm and 0.15 ppm, respectively.

There is no significant difference for CH_4 concentrations between the fog and non-fog samples. There is however, a significant difference between the CO concentrations. A student's "t" test shows a significant difference at the 95% confidence level. No analysis for CH_4 and CO were conducted on fog water because of the small amount of water which was collected. It has been shown by Swinnerton et.al. (1971) that rainwater collected at several sites was supersaturated (up to 200 fold) with CO, but at a close state of equilibrium for CH_4. It may be possible that the fog itself is acting as a scavenging agent for carbon monoxide, but not for methane. This would help to explain the lower values found in the fog samples as compared to the non-fog samples. If one uses the average background level for CO as 0.16 ppm (non-fog value), then fog, in this instance, can scavenge about 20% of the atmospheric CO content within the fog site. At the present time, it is not possible to quantize the amount of scavenging that could have taken place; nor is it possible to extrapolate the present data to all fogs and state that the atmospheric CO concentration will be lower within fogs than outside them.

Number	CH_4 (ppm)	CO(ppm)	Time/Date
Samples Collected in Fog Conditions			
5	1.56	0.11	0940 - 8/4/75
6	1.57	0.13	0530 - 8/6/75
Z4	1.55	0.13	1720 - 8/9/75
10	1.56	0.13	1515 - 8/10/75
Average	1.56	0.13	
Samples Collected in Non Fog Conditions			
2	1.55	0.14	2020 - 8/1/75
3	1.54	0.19	1352 - 8/2/75
4	1.56	0.15	1500 - 8/3/75
7	1.56	0.19	1100 - 8/6/75
8	1.53	0.14	2020 - 8/6/75
9	1.56	0.15	1300 - 8/7/75
11	1.56	0.14	1730 - 8/17/75
12	1.53	0.17	1210 - 8/18/75
Average	1.55	0.16	
Samples Collected in Non Fog Conditions - High Values			
1	1.59	0.33	1800 - 7/30/75
Z5	1.63	0.31	1745 - 8/11/75
Average	1.61	0.32	

Swinnerton J. W., V. J. Linnenbom, and C. H. Cheek, (1962a), "Determination of dissolved in aqueous solution by gas chromatography" Anal. Chem., 34, 483-485.

Swinnerton J. W., V. J. Linnenbom, and C. H. Cheek, (1962b), "Revised sampling procedure for determination of dissolved gases in solution by gas chromatography," Anal. Chem., 34, 1509.

Swinnerton J. W., and V. J. Linnenbom, (1967a), "Gaseous hydrocarbons in seawater: determination," Science, 156, 1119-1120.

Swinnerton J. W., R. A. Lamontagne, and V. J. Linnenbom, (1971) "Carbon monoxide in rainwater," Science 172, 943-945.

The USNS HAYES changed course to 330 shortly after 0830 at 43°N, 62°21W. High altitude winds continued strong and northerly, but conflicting surface wind indications from the two weather map sources are shown by two 5 knot surface wind flags. Measured true wind was unavailable until after 1200 when generally light winds swinging from south to east prevailed for the remainder of the day. Visibility was unlimited and radon was 15 pCi m^{-3} at 0800. The lower shipboard wind measurement as translated into true wind is designated by "L" when there was a consistent difference.

AIR MASS ORIGINS

The quantity and reliability of information obtainable from analysis of meteorological data is proportional to the extent of the analysis. In order to trace an air parcel for a period of several days minimally requires twelve hourly backtracking from the point of interest on surface, and higher altitude maps (700 or 500 mb) as well as establishing the ascent or subsidence of air along the route from satellite/IR, or microwave, or other data.

The suggestions of air mass origins presented here are from simple observation of weather maps and ship wind data and refer to the recent past. Throughout most of the cruise, agreement between ship and weather map data and the overall weather picture were good enough to establish the recent history of the air in the vicinity of the ship, and the overall situation could be interpreted during most fog events.

On 31 July, a high pressure area over Delaware has strengthened and together with a low pressure south of Newfoundland result in a slow but well defined flow of air from over northern New England and the Maritime provinces to the vicinity of the HAYES which is now approaching Nova Scotia. Wind data from the ship and the map are in good agreement and the high radon confirms the recent continental origin of the air. Beginning on 1 August and continuing through 2 August and into 3 August, the surface air movements are not well defined, although the 700 and 500 mb air movements remain more or less northerly and at 30 to 50 knots. Surface winds and pressure gradients are weak. For example, at 1200Z on 2 August, two surface weather maps suggest local winds of 5 knots from 290° and 040° respectively, while subsequent ship data is from 180°. The moderate continental contribution (10 to 15 pCi m^{-3}) and surface maps indicate that the air may have been over the US and traveled to the area of the ship via counterclockwise motion around a weak low pressure area. However, the radon data is equally consistent with the proposal by Lee (1976) that the high level northerly flow of air over Nova Scotia subsided and was subsequently returned to the area of the ship by southerly winds.

By the afternoon of 3 August, the winds at all levels are northeast at 10 knots and the continental influence is being reduced by the influx of maritime air. The low concentrations of radon on 4 August are the result of a well defined flow of air from the Mid-Atlantic into the area. The fluctuations on the fourth, as well as other days, are characteristic of being near land (less than 200 miles or so from the coast) where local mixings and eddies may occur in any flow other than almost directly off shore.

The USNS HAYES changed course to 330 shortly after 0830 at 43^{o}N, 62^{o}21W. High altitude winds continued strong and northerly, but conflicting surface wind indications from the two weather map sources are shown by two 5 knot surface wind flags. Measured true wind was unavailable until after 1200 when generally light winds swinging from south to east prevailed for the remainder of the day. Visibility was unlimited and radon was 15 pCi m^{-3} at 0800. The lower shipboard wind measurement as translated into true wind is designated by "L" when there was a consistent difference.

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Shortly after 2000 hour local time on 4 August, the winds swing around to generally northerly direction at 10 knots and by 0600 on the 5th, we were moving into continental air about 60 miles off Nova Scotia. Later in the day, the USNS HAYES moved further east and out of air coming from mostly over land into air which had spent more time over the water north and east of Nova Scotia. High radon near Nova Scotia may be a consequence of being rather close to a large land area in terms of both insufficient time for radon to decay or be vertically transported. These measurements are surface measurements and as such, can be related to the total columnar radon only if vertical profiles are known or can be estimated from knowledge of the air mass history extending back several days.

On 7 and 8 August, the air mass movements are not clear with a general westerly flow off the US and Canada at higher altitudes contending with a weak surface counterclockwise flow around a low pressure area off New Jersey. Maritime radon concentrations on the ninth, tenth, and eleventh (until the HAYES returned to the "continental" air near Halifax) are a consequence of radon decay during transit from land areas at the slow advection rates prevailing as indicated by the low winds at all altitudes, and/or to the increased mixing of clear equatorial air into the prevailing northeasterly air flows.

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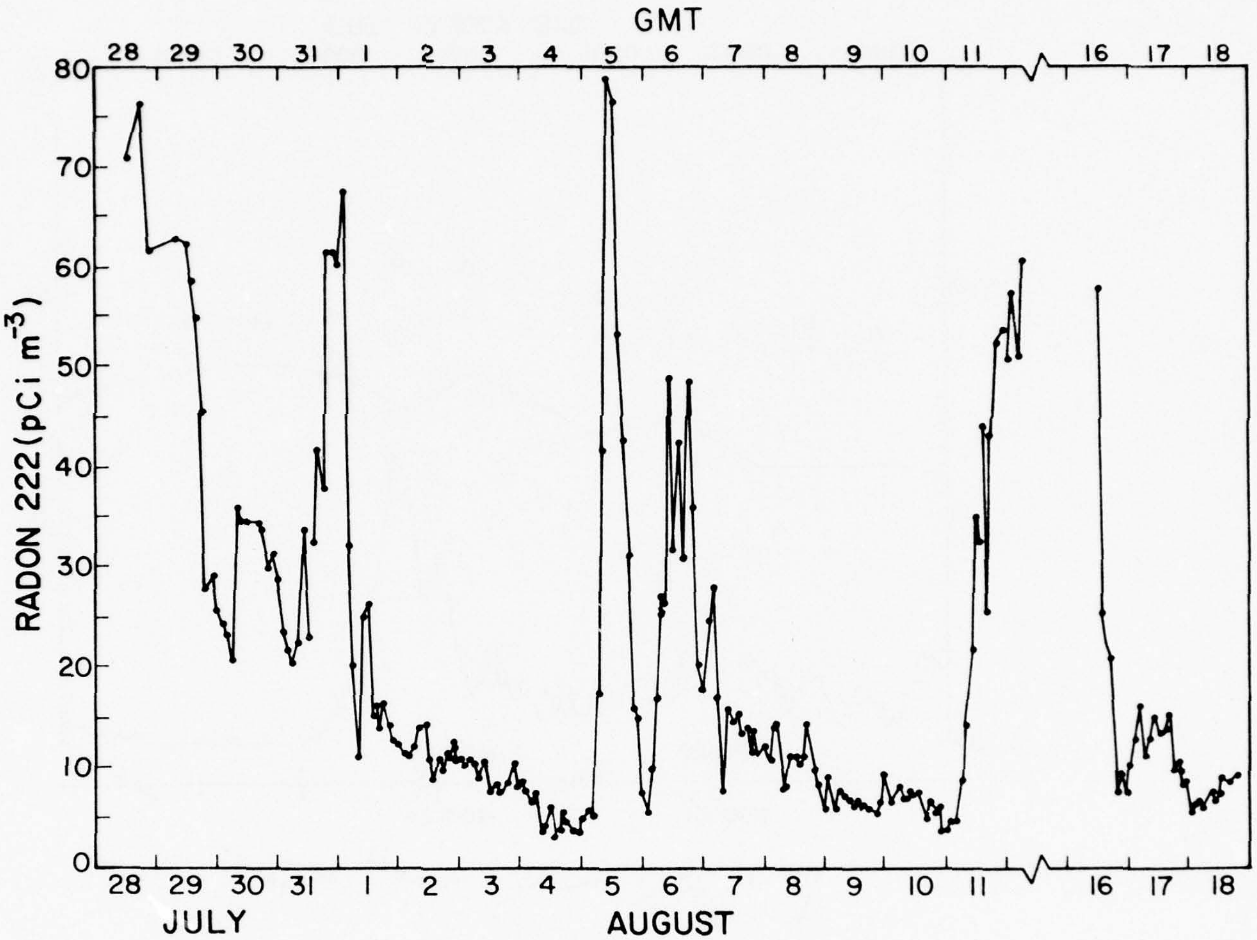
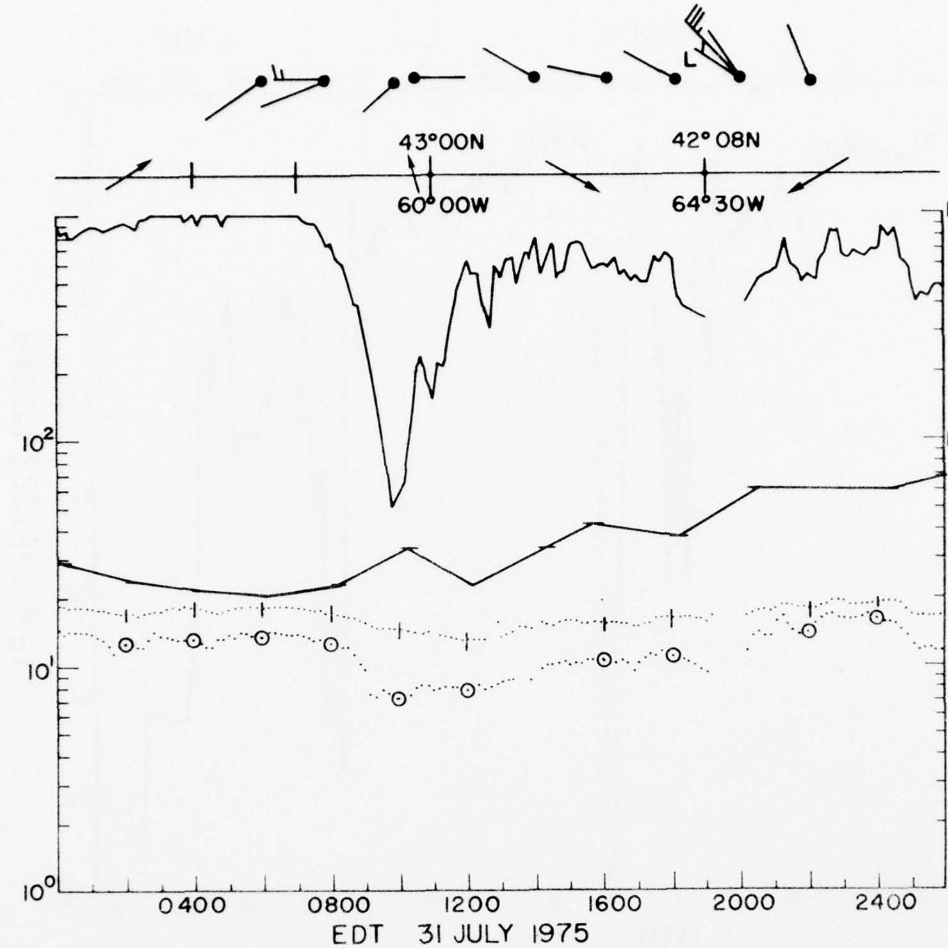


NOVA SCOTIA FOG CRUISE 1975


43°00N
60°00W
42° 08N
64°30W
L
10^4
10^3
10^2
10^1
10^0
0400
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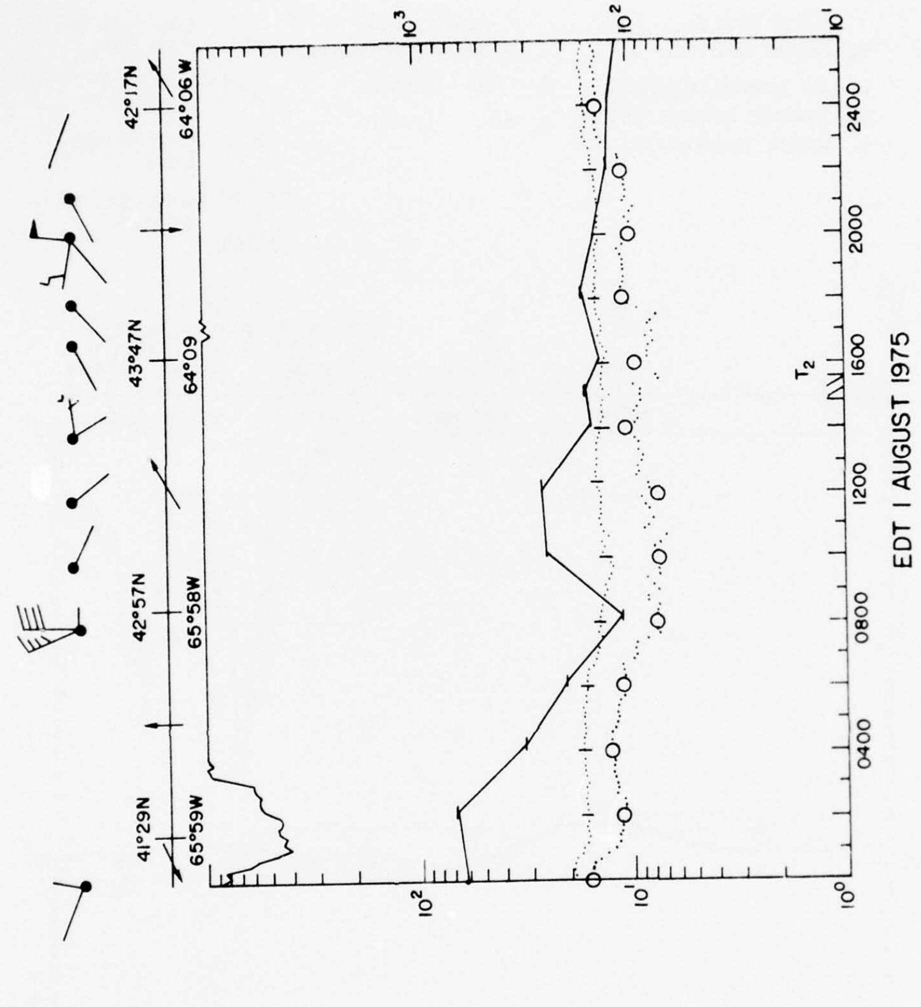
1200
1600
2000
2400
EDT 31 JULY 1975


41°29N
65°59W
42°57N
65°58W
43°47N
64°09
42°17N
64°06W
10^0
10^1
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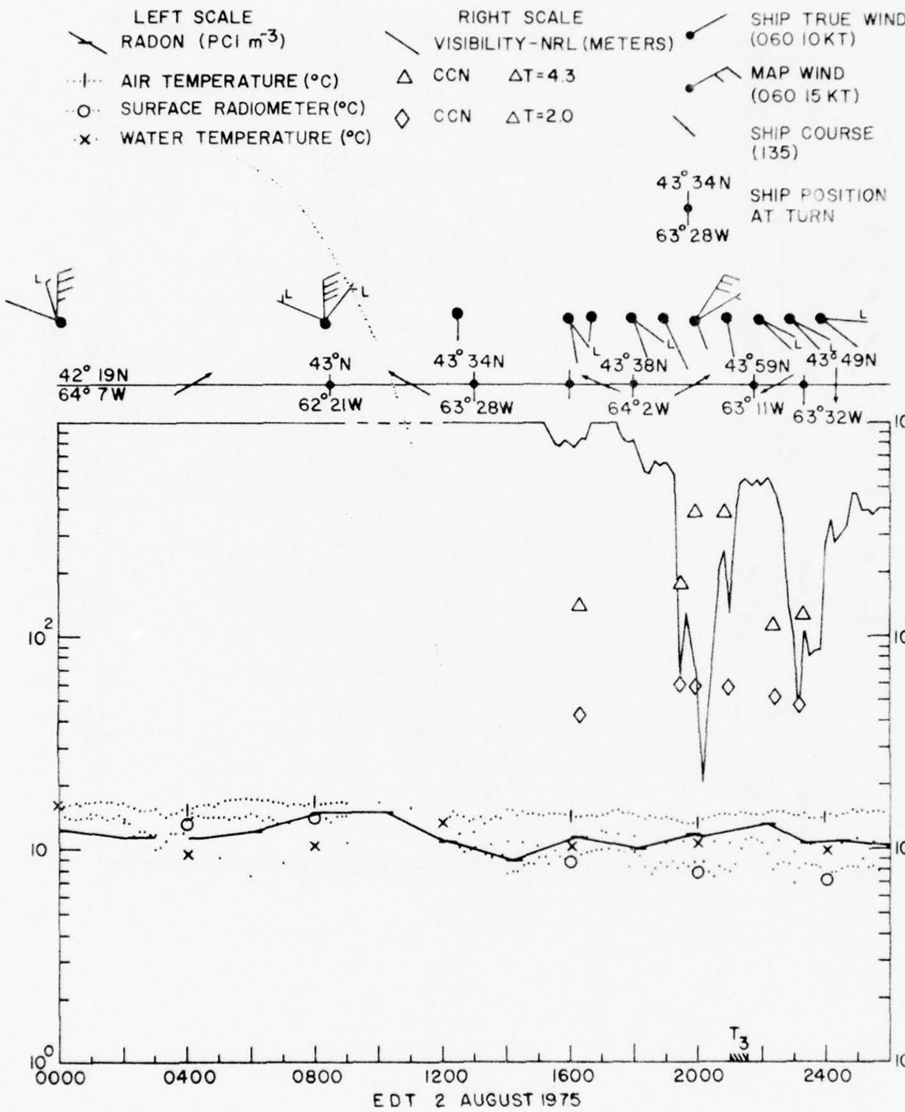
T_2
EDT 1 AUGUST 1975



LEFT SCALE
RADON (PCI m-3)
AIR TEMPERATURE (°C)
SURFACE RADIOMETER (°C)
WATER TEMPERATURE (°C)
RIGHT SCALE
VISIBILITY-NRL (METERS)
CCN ΔT=4.3
CCN ΔT=2.0
SHIP TRUE WIND (060 10KT)
MAP WIND (060 15 KT)
SHIP COURSE (135)
43° 34N
63° 28W
SHIP POSITION AT TURN
42° 19N
64° 7W
43°N
62° 21W
43° 34N
63° 28W
43° 38N
64° 2W
43° 59N
63° 11W
43° 49N
63° 32W
T3
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0400
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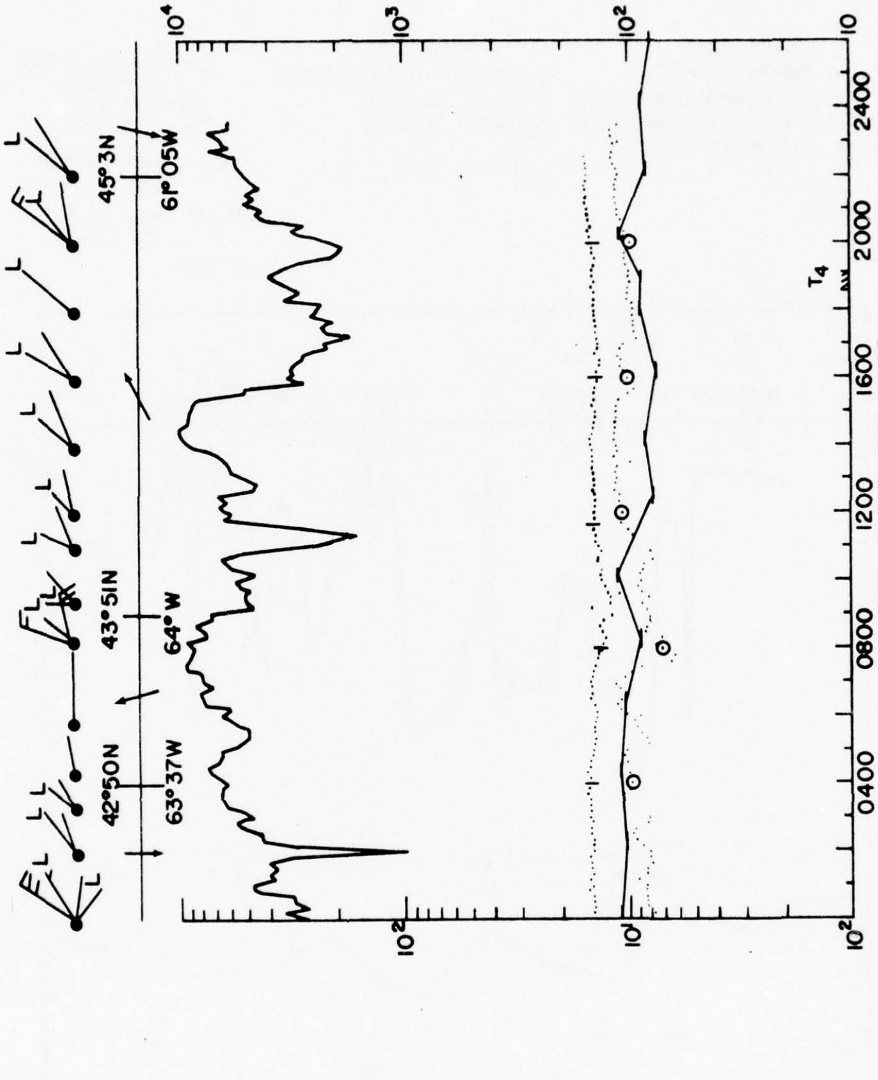
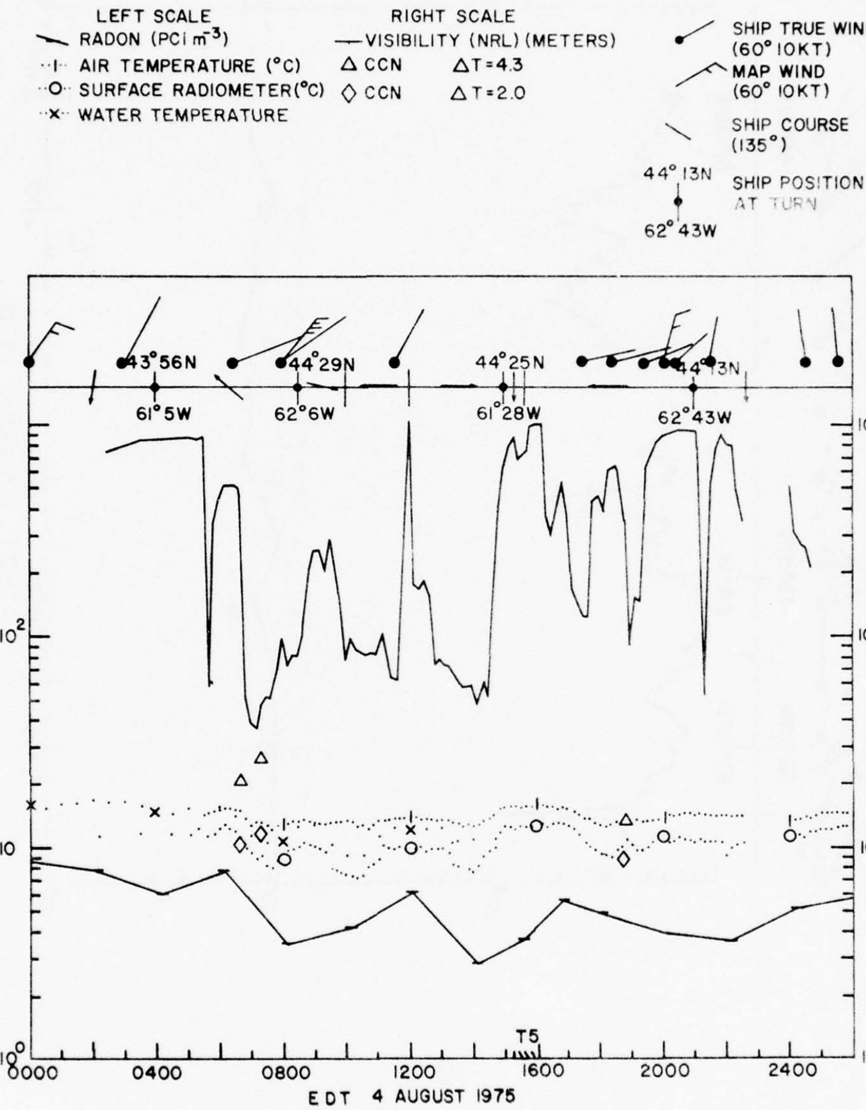
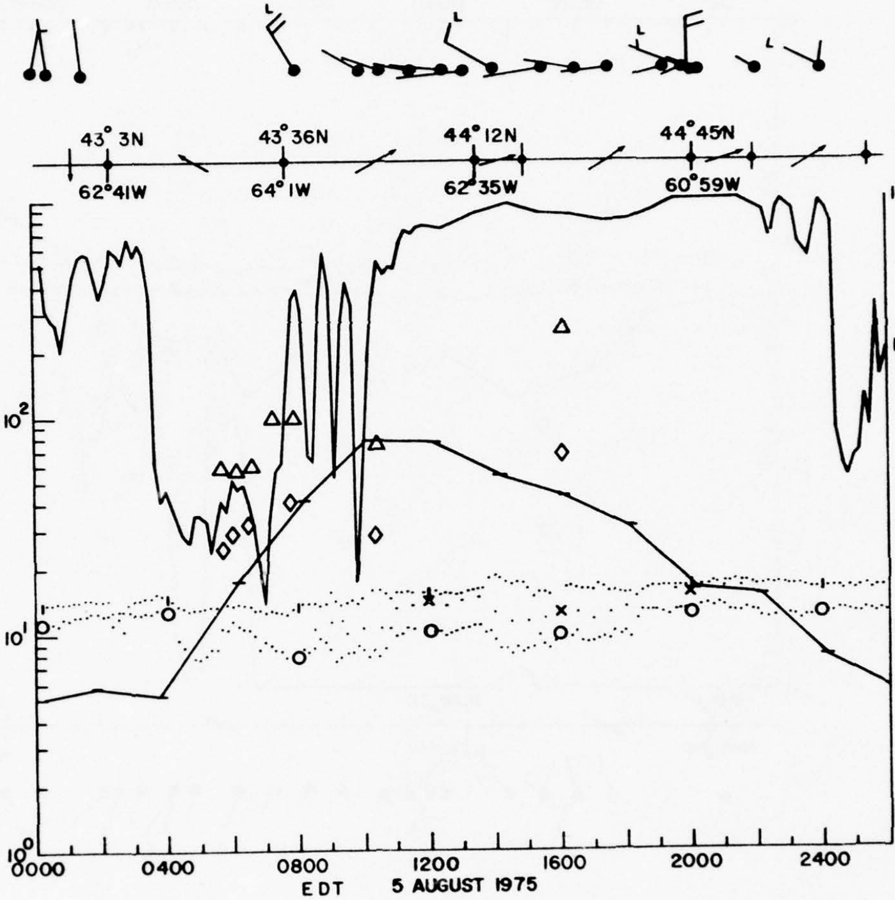
1200
1600
2000
2400
EDT 2 AUGUST 1975


42°50N
63°37W
43°51N
64°W
45°3N
61°05W
10^4
10^3
10^2
10
10^2
10^1
10^2
0400
0800
1200
1600
2000
2400
EDT 3 AUGUST 1975
T4


LEFT SCALE
RADON (PCi m⁻³)
AIR TEMPERATURE (°C)
SURFACE RADIOMETER (°C)
WATER TEMPERATURE
RIGHT SCALE
VISIBILITY (NRL) (METERS)
CCN ΔT=4.3
CCN ΔT=2.0
SHIP TRUE WIND (60° 10KT)
MAP WIND (60° 10KT)
SHIP COURSE (135°)
44° 13N
62° 43W
SHIP POSITION AT TURN
43°56N
61°5W
44°29N
62°6W
44°25N
61°28W
44°13N
62°43W
T5
0000
0400
0800
1200
1600
2000
2400
EDT 4 AUGUST 1975



43° 3N
62°41W
43° 36N
64° 1W
44° 12N
62° 35W
44° 45N
60° 59W
10^4
10^3
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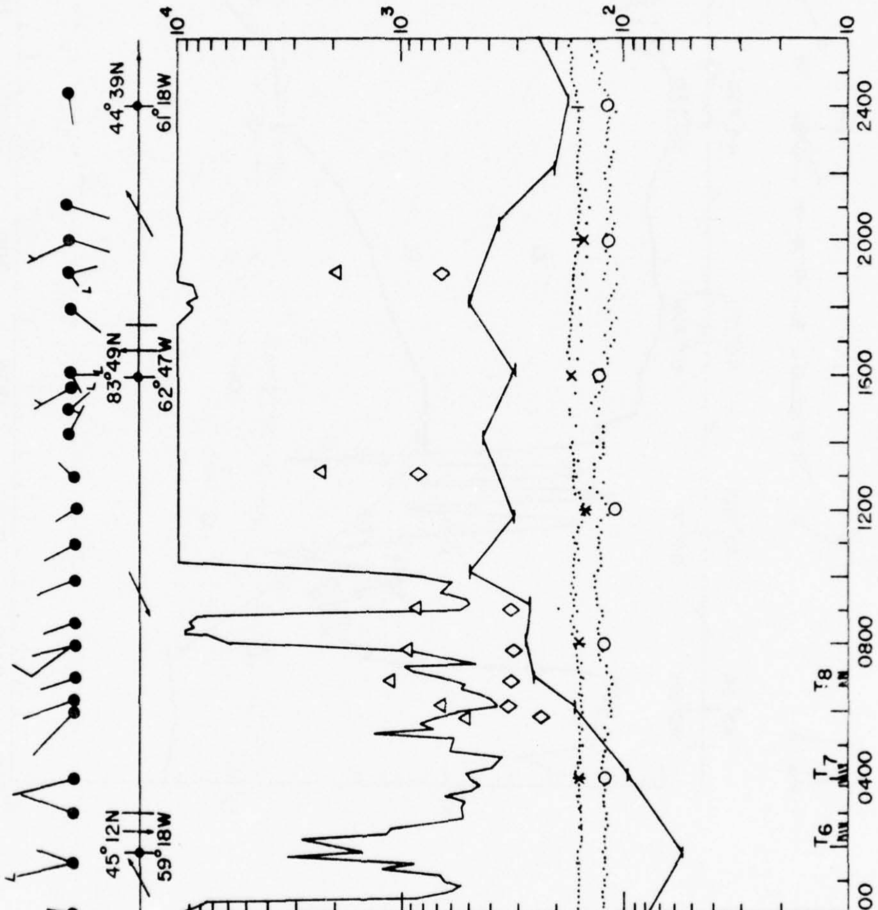
2400
EDT
5 AUGUST 1975


45°12N
59°18W
83°49N
62°47W
44°39N
61°18W
T6
T7
T8
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10^2
10^3
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10^2
10^3
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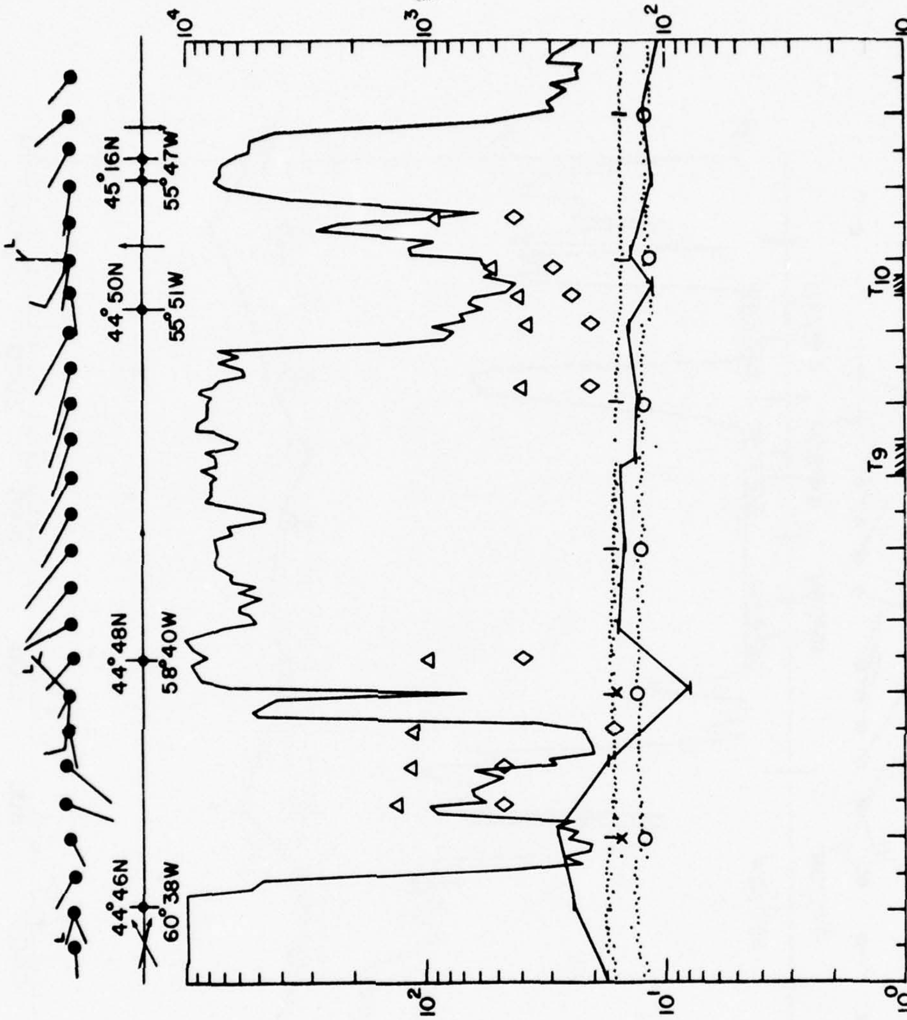
0400
0800
1200
1600
2000
2400
EDT 6 AUGUST 1975



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58°40W
44°50N
55°51W
45°16N
55°47W
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10^3
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2000
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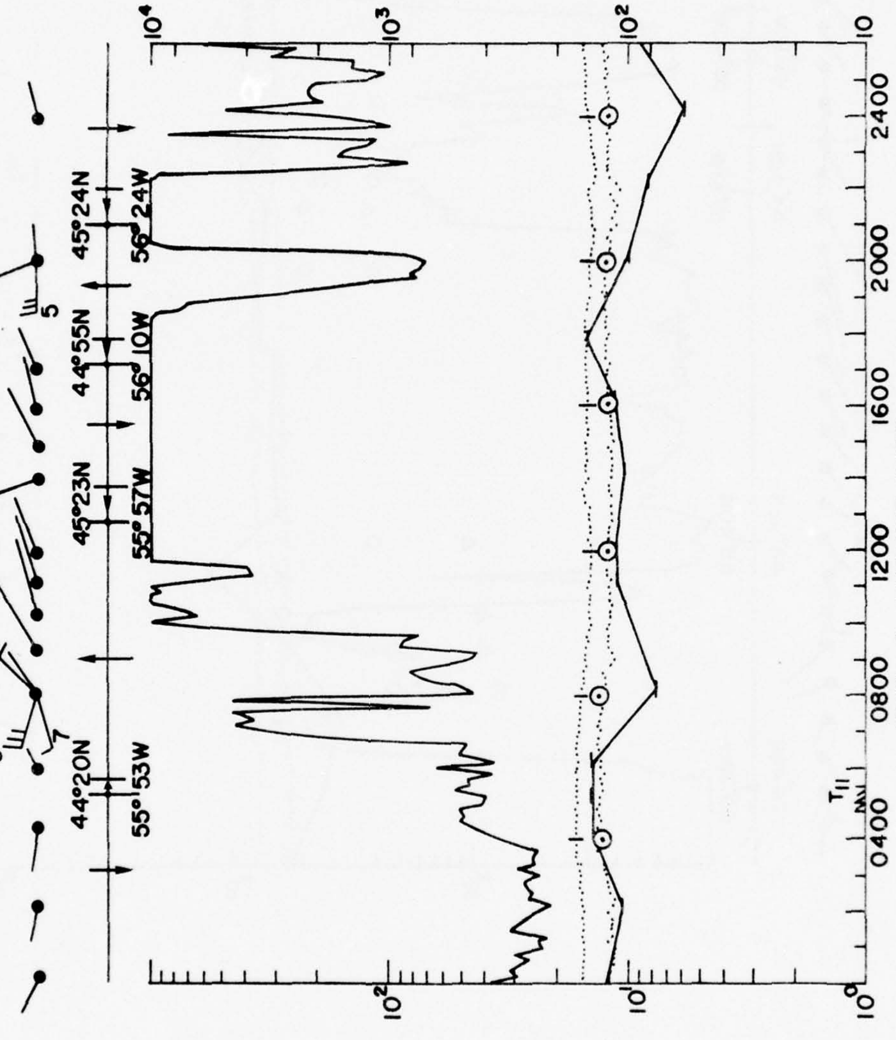
EDT 7 AUGUST 1975
T9
T10



44°20N 55°53W
45°23N 55°57W
44°55N 56°10W
45°24N 56°24W
5
5
0400
0800
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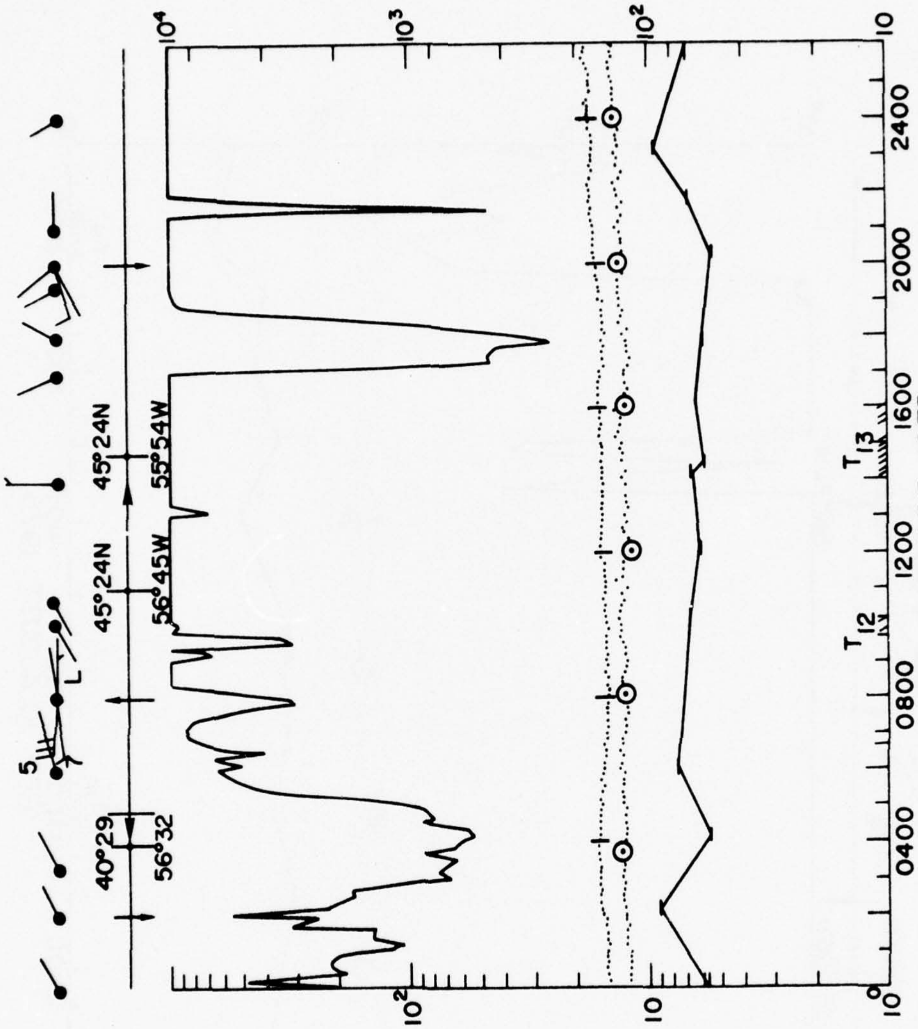
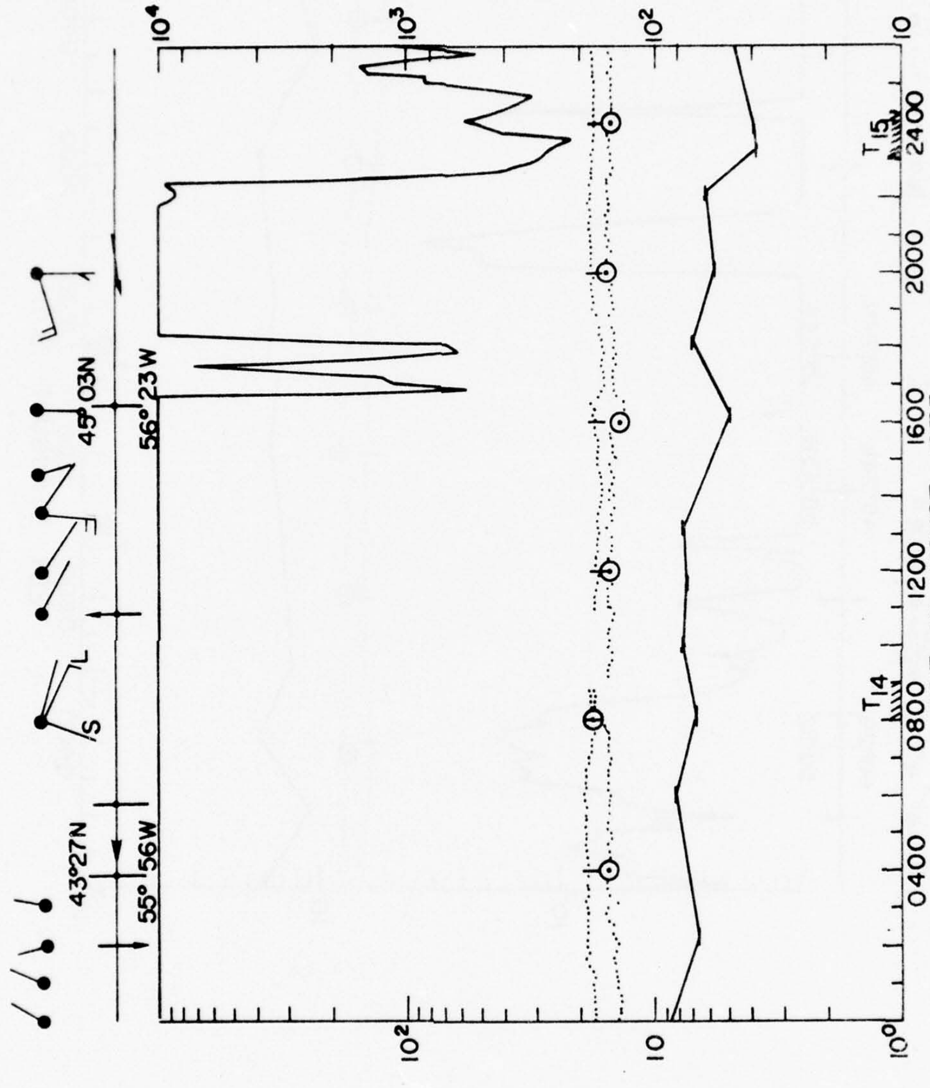
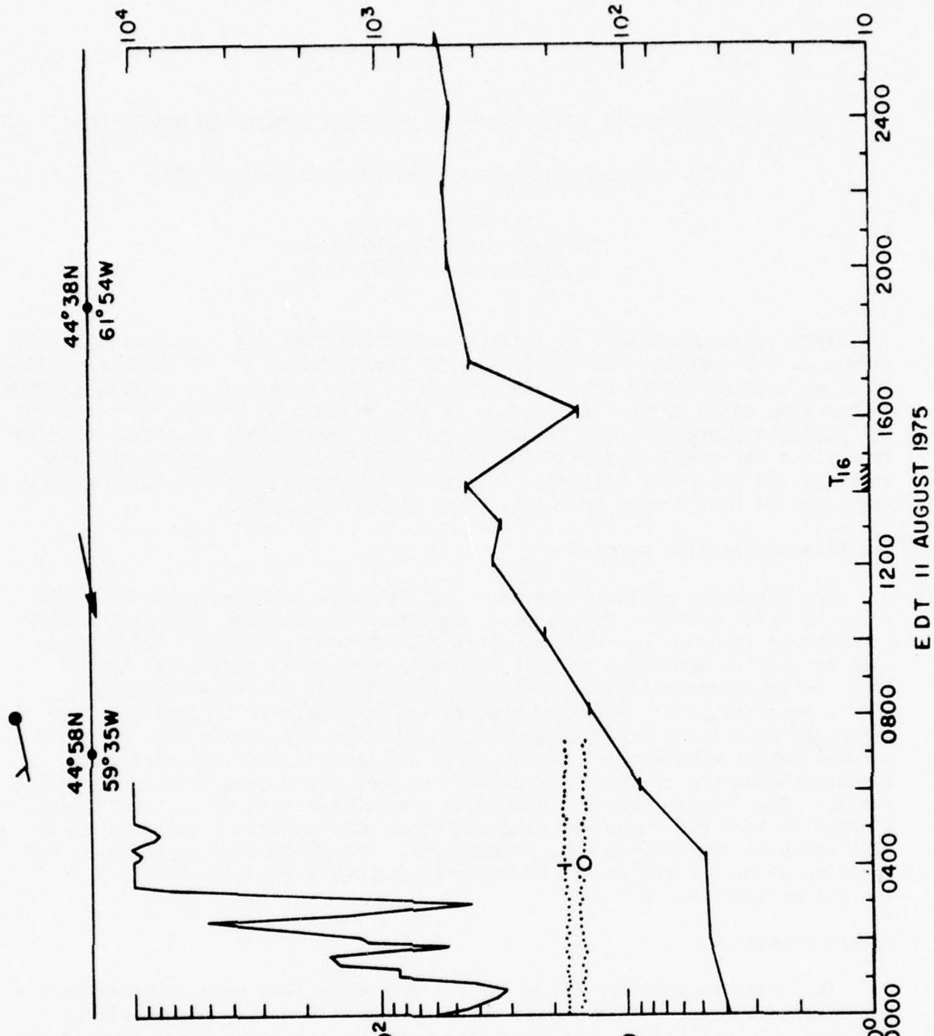
10²
10³
10⁴
10



10^4
10^3
10^2
10
10^0
45°24N
55°54W
45°24N
56°45W
40°29
56°32
5
L
T12
T13
0400
0800
1200
1600
2000
2400
EDT 9 AUGUST 1975



EDT 10 AUGUST 1975
0400
0800
1200
1600
2000
2400
10^4
10^3
10^2
10
10^0
T_{14}
T_{15}
43°27N
55° 56W
45° 03N
56° 23W
S
L


44°58N
59°35W
44°38N
61°54W
T16
EDT 11 AUGUST 1975
0000
0400
0800
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1600
2000
2400
10^0
10
10^2
10
10^2
10^3
10^4

PHYSICAL EFFECTS OF SURFACE-ACTIVE MATERIAL PRESENT IN MARINE FOG

WATER COLLECTED NEAR THE COAST OF NOVA SCOTIA, 1975

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Chemical Oceanography Branch
Naval Research Laboratory

Very small quantities of surface-active material may have a significant effect on the formation or dissipation of fog or haze.[1,2] At present, little is known with certainty about the effects of this material in nature, although it has been found on the sea surface [3,4,5], is known to be transported into the marine atmosphere[6], and is associated with particulate material filtered from clear air over the sea[7,8]. Surface-active film-forming material was found in the fog water collected during the cruise of the USNS HAYES near the coast of Nova Scotia from July 29 to August 12, 1975[9].

Fog Water Collection Methods

Fog water was collected by personnel from the Calspan Corporation and from the Naval Research Laboratory. Samples were obtained from both groups in order to examine the surface-active film-forming material. The methods used by the two groups to collect fog water were quite different. Since they are explained elsewhere, detailed descriptions of the methods will not be repeated here. Briefly, the NRL method consisted of impinging the fog drops on a large nylon screen[10] mounted above the bow as the ship's forward motion caused the fog-drop laden air to pass through the screen. The water from the coalescing droplets ran down the screen into a collection vessel. The Calspan technique employed a metal bar with collection vessels mounted at each end which was attached to an electric motor and rotated at high speed in the fashion of a propeller[11]. Fog drops were impinged on the rotating metal bar and due to the centrifugal force ran down the bar into the collection vessels.

Sample Treatment

The glass stoppered bottles for the fog water that were supplied to the investigators prior to the cruise were cleaned with sodium dichromate in sulfuric acid and rinsed with distilled water. An acetone rinse removed the water. When dry, the bottles were rinsed again with AR grade chloroform and dried. The bottles were then wrapped in aluminum foil to keep them clean. To inhibit biological activity in the samples, the investigators were asked to add 1 ml of chloroform to each bottle of fog water before sealing for return to the laboratory. After closing, the bottles were again wrapped in aluminum foil to keep them clean during shipment to the laboratory for determination of force vs area isotherms of any surface-active film-forming material that might be present. All 50 ml samples still contained chloroform when the surface chemistry studies began on October 2, 1975. Particulate material was present in all samples. The particles in these samples must have been

present in the fog since the presence of chloroform in the samples essentially eliminated the possibility of the material being formed by biological action during storage.

Experimental Technique

A small trough 40 cm long by 3 cm wide and 3mm deep was constructed of acrylic plastic to hold 50 ml of fog water for the determination of the film pressure vs. area isotherm of the surface film formed on each fog water sample. The last 5 cm of the channel was made 5 cm wide to keep the sensor away from the channel walls. A film pressure vs. area isotherm is analogous to a pressure vs. volume diagram for a two dimensional gas. It describes the change in film pressure as the surface area available to the film is changed. Film pressure is simply the difference between the surface tension of pure water and the surface tension of water covered by an adsorbed film. It was not necessary to know the detailed chemical composition of the film-forming material to determine its effect on surface tension, since changes in surface tension could be monitored directly as a function of surface concentration by merely compressing the surface to smaller areas with a movable bar. Samples of fog water were opened just prior to determining the film pressure vs. area curves, and filtered air was passed through a glass tube introduced to the bottom of the bottles to evaporate the chloroform remaining in each sample. The bottles were tilted in such a way that no jet drops from the bursting bubbles were lost. The air tube was withdrawn, and the glass stopper replaced. The sample was shaken vigorously, and 50 ml was poured into a graduated cylinder and then transferred to the small trough. Surface tension was determined by the Wilhelmy Plate technique[12] using apparatus described in detail in another publication.[5]

The specially constructed small trough was not necessary for the 500 ml fog water samples. These larger samples were added directly to the exis ng large triangular trough of the apparatus. The apparatus was cleaned between runs with triply distilled water. A run using this triple distilled water showed no change in surface tension as the bar moved over the water surface leaving a smaller and smaller area for any surface film to occupy. However, singly distilled water (not previously swept clean with a bar) contained enough surface-active material to produce the curve illustrated in Fig. 2. The curve for singly distilled water is included to give an indication of the quantities of material being examined and also an appreciation of the need for extreme cleanliness when performing such measurements.

Results

The film pressure vs. area curves determined for the fog water samples are shown in Figures 1, 2, and 3. Since the samples examined were of two different volumes, 50 and 500 ml, the area covered by the films is presented as area per milliliter of sample. Film pressure is equal to the surface tension of clean water minus the surface tension of water covered by a film. Since the surface tension of clean water is approximately 72 dynes/cm at 25°C a film pressure of 20 dynes/cm is approximately equivalent to a surface tension of 52 dynes/cm. The farther to the right that the curve for a sample lies, the more surface-active material is present in that sample,

assuming that the composition of the material is the same.

The curves for the 50 ml samples were not carried to film pressures as high as the 500 ml samples because there was less material to work with. All of the samples probably would have reached a film pressure of more than 30 dynes/cm if the area covered by the film could have been reduced sufficiently. There are no striking differences between the curves for samples collected by the two techniques, nor are there significant differences in apparent concentration due to the difference in sizes of the samples. It is likely that the curves reported here represent less than the full amount of surface-active material present in the original fog water for two reasons. Some of the tiny bubble film drops may have escaped during the removal of chloroform from the samples carrying with them adsorbed surface-active material, and during the determination of the force-area curves some of the surface-active material was probably adsorbed on the surface of the particulate matter observed in all samples.

Comparison to Other Environmental Samples

It is of interest to relate these samples to samples of clear marine air, and to samples of sea surface water, since natural surface films occurring in these other two media have been studied, although the data is sparse. Comparison of the film pressure vs. area curves for the 11 fog water samples to 14 sea water samples collected 1 mile off shore from Mission Bay, California[5], can be made directly, since both sets of data can be expressed in terms of film area per milliliter of water sampled. The results are shown in Figure 4, and indicate that in the samples examined, the fog water apparently contained more surface-active material than the sea surface water. The sea surface water samples were taken by touching a screen to the surface and then draining the water trapped between the wires. In theory, this method collects only the top fraction of a millimeter of the water, but in practice, because the sea surface is not perfectly flat, some water from a few centimeters below the surface is sampled. Therefore, a high concentration of surface-active material on the surface skin of the sea would be somewhat diluted by water from below when sampled by a screen and then expressed in terms of film area per ml of water. However, the screen technique is the best non-selective surface sampling method known at this time. As a consequence of the dilution, the band representing the 14 seawater surface samples in Figure 4 is probably displaced to the left of the position that it would occupy if only the surface skin of the water was sampled.

A comparison of the fog water results to surface film data for clear air was more difficult than a comparison to sea water since clear air data were stated in terms of film pressure vs. film area per cubic meter of air. However, since the liquid water content of some of the fogs was known (ml/m^3), the volumes of fog water collected could be expressed in terms of the corresponding volumes of air that they represented. The liquid water content of the fogs near Nova Scotia were monitored by the Calspan group, and sufficient data were obtained[13] to determine the corresponding air volume represented by the fog water samples examined for surface-active material. Data supplied were averaged and are shown in Table 1.

Since the data in Figures 1-3 were computed in terms of film area per ml of fog water, the abcissa values could simply be multiplied by the corresponding water content (ml/m^3) to give the film area per cubic meter of air. This enabled a comparison of the film pressure vs. area curves of the fog water to curves for surface active material in clean air sampled on a previous cruise in the equatorial Pacific Ocean. In Figure 5 data for 8 fog water samples are compared to data for particulates removed from 12 clear air samples. The horizontal bars crossing the lines for the average values extend one standard deviation on each side. Although the conversions to corresponding air volumes through fog water content values may be slightly in error, they are sufficiently accurate to illustrate that the marine fog water collected off the coast of Nova Scotia apparently contained less surface-active material than particulates filtered from clear air in the equatorial Pacific. Clear marine air data from near the Nova Scotia Coast would be of greater interest than Pacific data for comparison with the fog samples, but no such data exists at this time. There may be significantly less surface film forming material in fog water than in clear air or there may not be. The clear air particulate samples were filtered with glass fiber filters in high volume samplers. It is believed that essentially all particulate material was collected by this technique, since nearly 100% of the particles greater than 0.3 μm in diameter are collected by glass fiber filters[14]. The methods used to collect the fog water, on the other hand, definitely discriminate against the collection of smaller particles. There is reason to believe that the smallest particles may carry the highest amounts of surface-active material. If this is true, the data presented here for fog water may be low compared to the true average value describing the full spectrum of droplet and particle sizes in the air from which the fog water was collected. Some particles coated with surface-active films may not act as nuclei for fog drops at all, in which case the curves due to the fog drops would show less surface-active material relative to the actual content of the air in which the fog forms. Much more data will have to be obtained before a clear picture of the situation that actually exists can be determined.

Conclusions

Surface-active material capable of forming a film on fog drops and depressing the surface tension value below that due to pure water was found in every fog water sample examined. The change in film pressure due to a reduction in the area available for the film was presented in Figures 1-3. Since as a droplet evaporates, the surface area decreases, these curves may provide insight into dissipation behavior of fogs. A definitive comparison of films associated with fog water to films found on the surface of the sea and to films associated with airborne particulate matter cannot be made at this time although speculations based on the data presently available have been made.

Acknowledgments

I am very grateful to David J. Bressan of NRL and to Robert E. Baier of the CALSPAN Corporation who carefully collected and provided the samples

for analysis. Eugene J. Mack of Calspan helpfully provided the data from which the average liquid water content of the fogs corresponding to the samples were computed.

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TABLE 1

Averaged Liquid Water Content of Fogs Sampled Near the Coast of Nova Scotia†

Date	Time (EST)	$\frac{\text{ml water}^*}{\text{m}^3\ \text{air}}$
3 August 1975	2251-2303	.03
4 August 1975	0700-0835	.11
5 August 1975	0656-0732	.26
7 August 1975	0407-0652	.27
8 August 1975	0158-0330	.46

*assuming 1 gm fog water = 1 ml

†Source: E. J. Mack, Calspan Corp.

Figure Legends

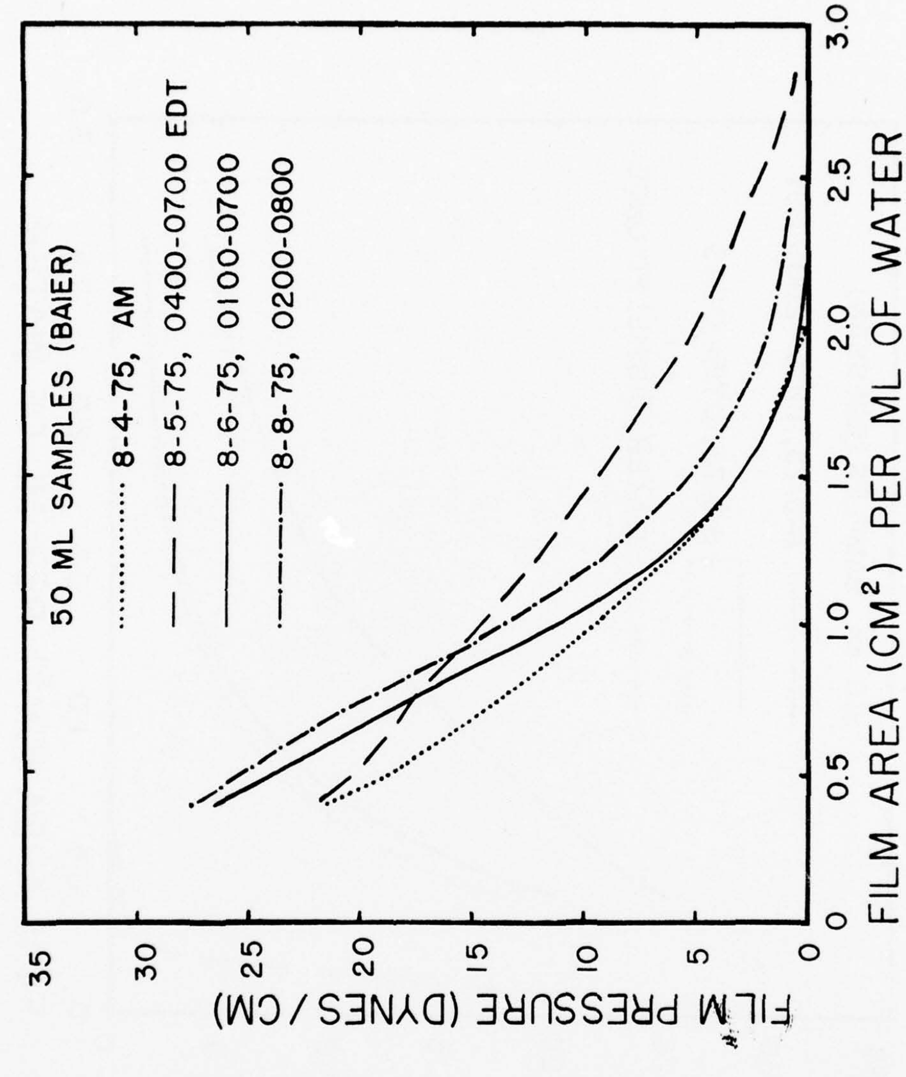
Figure 1: Film pressure vs. area isotherms for 50 ml fog water samples collected by the Calspan rotating sampler. To convert a film pressure value to the corresponding value of surface tension $\pm$ 1 dyne/cm, subtract the film pressure from 72 dynes/cm (at 25°C). When two curves are compared, a greater amount of surface-active material is indicated by the curve lying to the right.

Figure 2: Film pressure vs. area isotherms for 50 ml fog water samples collected by the NRL nylon screen collector. To convert a film pressure value to the corresponding value of surface tension $\pm$1 dyne/cm, subtract the film pressure from 72 dynes/cm (at 25°C). When two curves are compared, a greater amount of surface-active material is indicated by the curve lying to the right.

Figure 3: Film pressure vs. area isotherms for 500 ml fog water samples collected by the NRL nylon screen collector. To convert a film pressure value to the corresponding value of surface tension $\pm$1 dyne/cm, subtract the film pressure from 72 dynes/cm (at 25°C). When two curves are compared, a greater amount of surface-active material is indicated by the curve lying to the right.

Figure 4: Comparison of film pressure vs. area data for fog water and for sea surface water. All samples examined lie within the cross hatched areas. To convert a film pressure value to the corresponding value of surface tension $\pm$1 dyne/cm, subtract the film pressure from 72 dynes/cm (at 25°C). When two curves are compared, a greater amount of surface-active material is indicated by the curve lying to the right.

Figure 5: Comparison of film pressure vs. area data for fog water and for particles filtered from clear air. The horizontal bars extend to one standard deviation on both sides of the curves representing the arithmetic means of each group of samples. To convert a film pressure value to the corresponding value of surface tension $\pm$1 dyne/cm, subtract the film pressure from 72 dynes/cm (at25°C). When two curves are compared, a greater amount of surface-active material is indicated by the curve lying to the right.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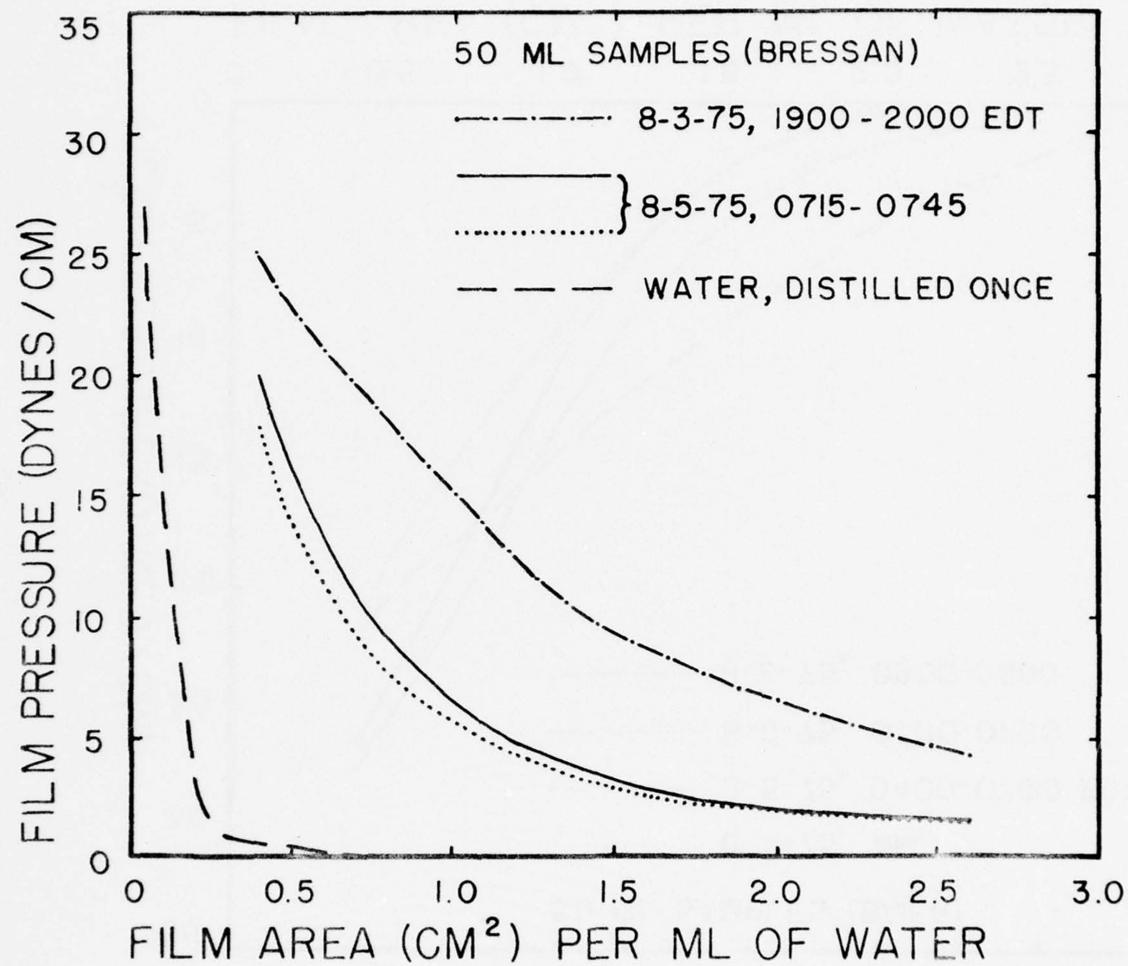
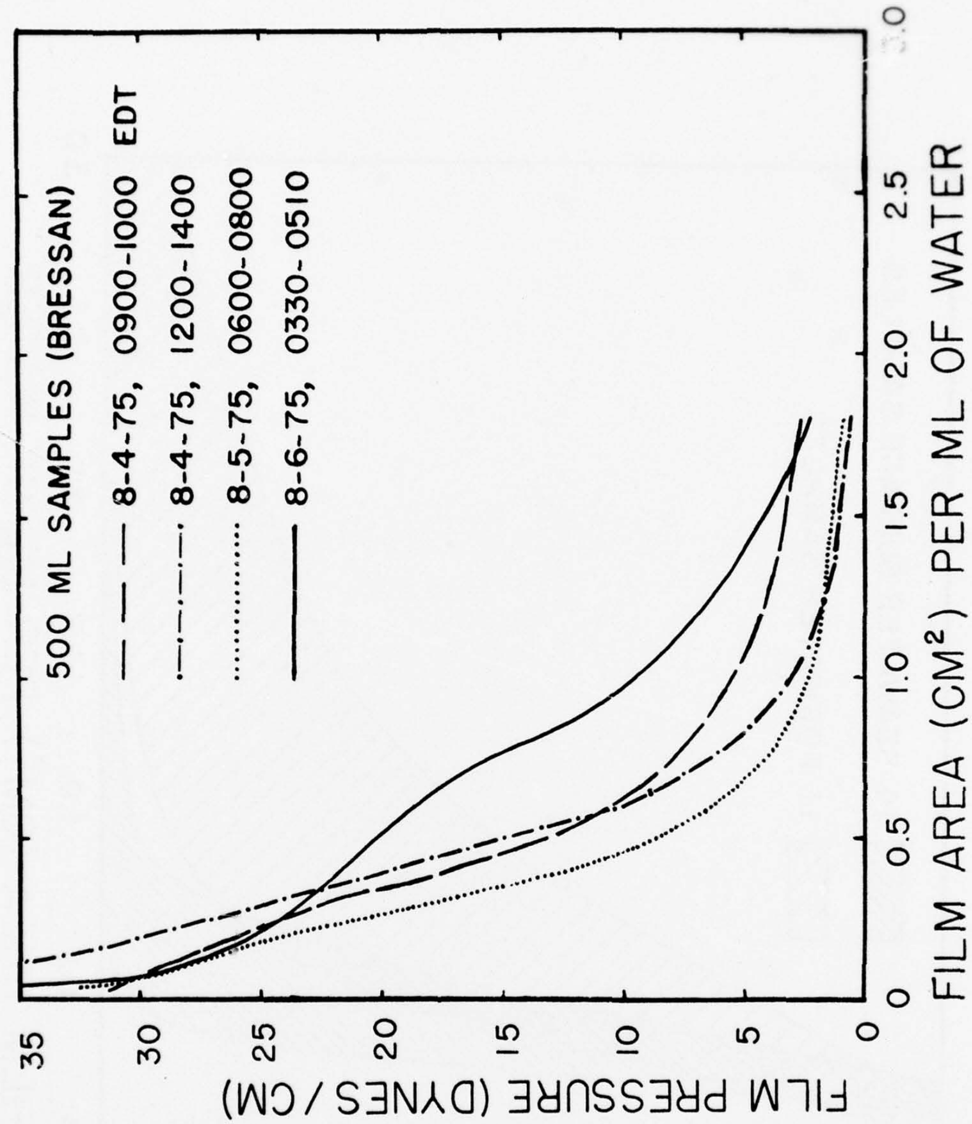
8-4-75, AM
8-5-75, 0400-0700 EDT
8-6-75, 0100-0700
8-8-75, 0200-0800
FILM PRESSURE (DYNES / CM)
0
5
10
15
20
25
30
35
FILM AREA (CM^2) PER ML OF WATER
0
0.5
1.0
1.5
2.0
2.5
3.0


50 ML SAMPLES (BRESSAN)
8-3-75, 1900 - 2000 EDT
8-5-75, 0715- 0745
WATER, DISTILLED ONCE
FILM PRESSURE (DYNES / CM)
FILM AREA (CM²) PER ML OF WATER
0
5
10
15
20
25
30
35
0.5
1.0
1.5
2.0
2.5
3.0


500 ML SAMPLES (BRESSAN)
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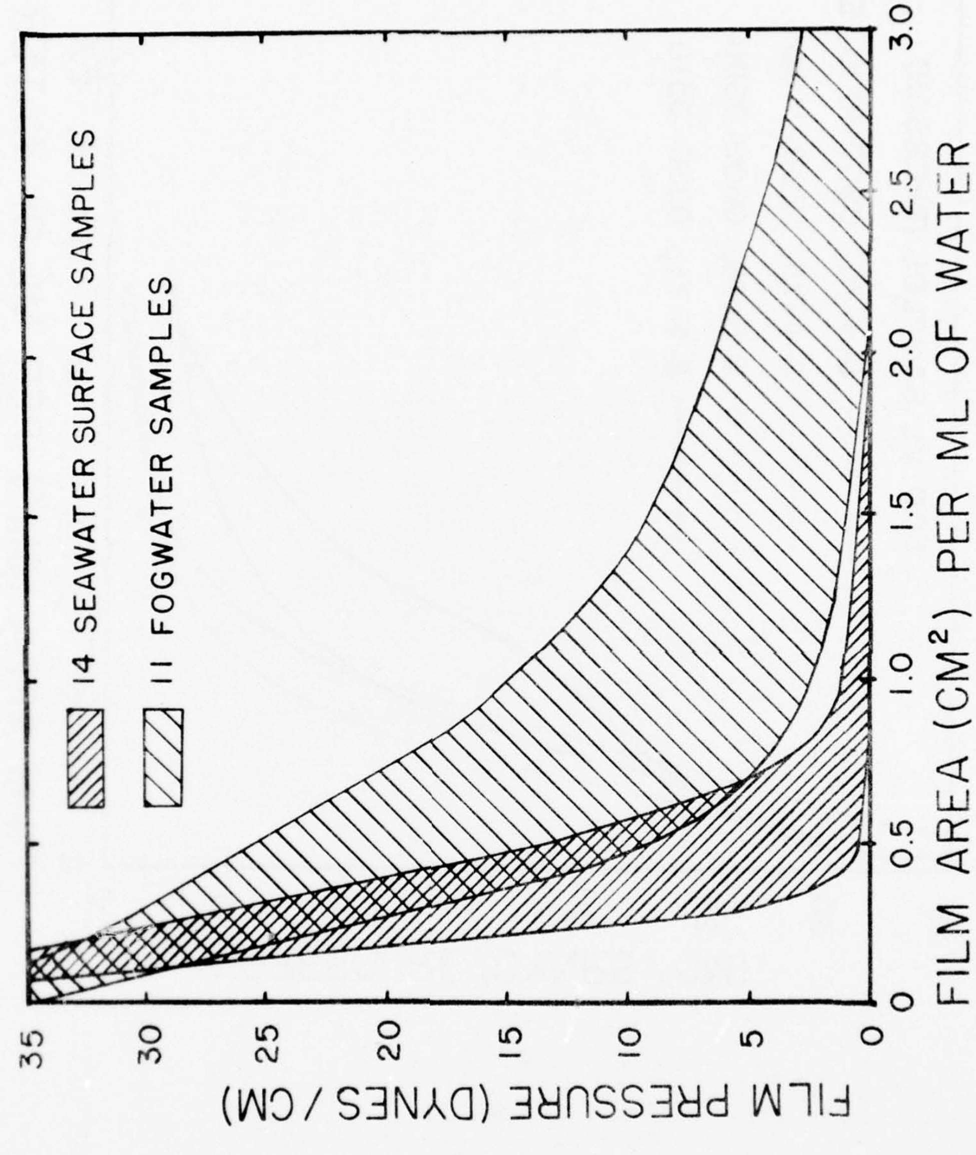
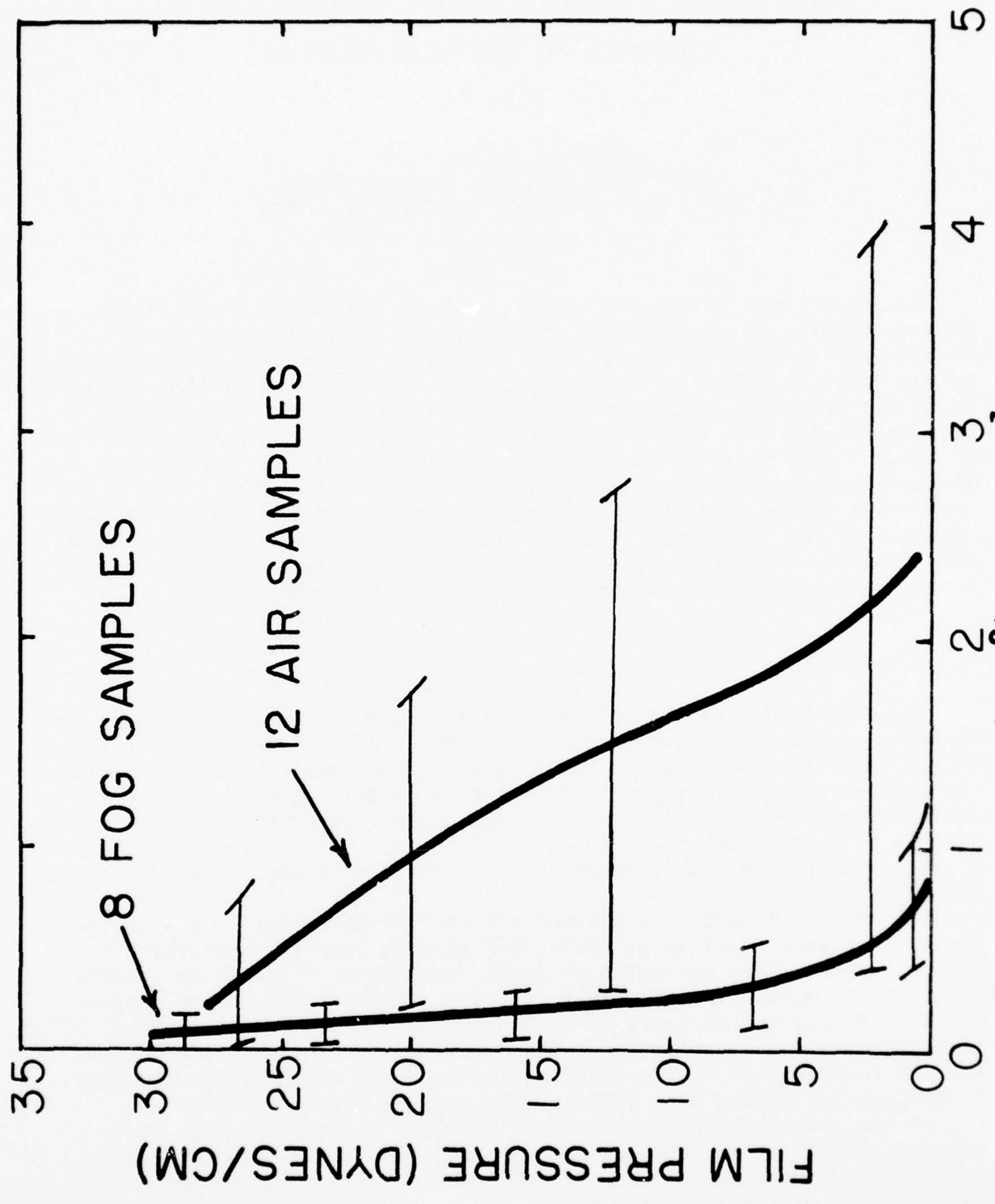
8-4-75, 1200-1400
8-5-75, 0600-0800
8-6-75, 0330-0510
FILM PRESSURE (DYNES / CM)
FILM AREA (CM²) PER ML OF WATER
0
5
10
15
20
25
30
35
0
0.5
1.0
1.5
2.0
2.5
3.0


14 SEAWATER SURFACE SAMPLES
11 FOGWATER SAMPLES
FILM AREA (CM²) PER ML OF WATER
FILM PRESSURE (DYNES / CM)
0
0.5
1.0
1.5
2.0
2.5
3.0
0
5
10
15
20
25
30
35


8 FOG SAMPLES
12 AIR SAMPLES
FILM PRESSURE (DYNES/CM)
FILM AREA (CM²) PER M³ OF AIR
0
5
10
15
20
25
30
35
0
1
2
3
4
5

THE INFLUENCE OF DISSOLVED ORGANIC MATERIAL IN THE SEA

ON THE EJECTION HEIGHTS OF JET DROPS

by

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State University of New York at Albany

Abstract

During cruises of the USNS Hayes, in both the Atlantic and Pacific Oceans, samples of seawater and fog water were collected and tested immediately in a bubble aging tube. With this device data were obtained on the ejection height of the top jet drop as a function of the time spent by an air bubble in rising to the surface of the water. In all cases a decrease in jet drop height was observed with increasing bubble age. It is thought that this is caused by the adsorption onto the bubble of dissolved surface-active organic material in the sea. This lowers the bubble surface free energy, the source of the energy for the ejection of the jet drops. The characteristics of the height-age curve vary from one seawater sample to the next, reflecting differences in the nature of the dissolved surface-active organic material.

1. Introduction

About 10^{10} tons of sea salt are ejected from the World Ocean into the atmosphere each year (Blanchard, 1963). Most of this probably originated as jet drops from air bubbles bursting at the surface of the sea. Since the initial kinetic energy of the jet drops is derived from the bubble surface free energy, it follows that the adsorption of the surface-active species of organic material dissolved in the sea will lower the bubble surface free energy and, presumably, the ejection height of the jet drops (Blanchard, 1975).

The organic material is skimmed off the bubble surface via a bubble microtome effect (MacIntyre, 1968), and ejected into the atmosphere on the jet drops. This mechanism no doubt contributes to the high concentrations or organic material that have been found on the marine sea-salt aerosol (Barger and Garrett, 1970; Blanchard, 1968; Hoffman and Duce, 1974). Recent laboratory experiments by Hoffman (1975) have convincingly shown that at least a part of the organics found on the aerosol were adsorbed on air bubbles before they burst at the surface of the water.

If the above reasoning is correct then one ought to be able to do experiments with fresh samples of seawater, and obtain data that show decreases of jet drop ejection height with increasing bubble age. The shape of the height-age curve should depend on, among other things, the concentration, and perhaps species, of dissolved surface-active organic material in the seawater. Experiments to test these ideas were carried out during two cruises of the USNS Hayes. Although it was not possible

during the work on the Hayes to obtain data on the organic content of the seawater samples or of the jet drops, it was felt that this first study could reveal interesting height-age relationships suggestive of a major role played by trace organics in the sea in determining the ejection height, size, and concentration of materials in jet drops.

2. The experiments

All of the data were obtained with a bubble aging tube (Fig. 1). The sample of seawater to be tested was placed in the aging tube, and a stirring rod used to move the water slowly in a counter-clockwise direction. As the water moved down through the constriction its velocity increased to about 30 cm s^{-1}. In the section of the aging tube beneath the constriction a velocity gradient was established. Accordingly, a bubble released from the capillary tip rose to the point where its rise speed was equal to the downwelling speed of the water, and there it remained. At the end of any desired time the stirring rod was turned off. The bubble rose to the surface to burst and eject jet drops into the air. Other than the fact that the hydrostatic pressure is constant, the bubble aging tube models reasonably well the motion through the water of air bubbles produced by whitecaps (Blanchard and Woodcock, 1957). Details of the construction and use of the aging tube, and how to produce one bubble upon demand, can be found elsewhere (Blanchard, 1963).

Each day during the work at sea, and sometimes twice a day, the entire apparatus was taken apart and thoroughly cleaned. The capillary tip was bubbled for 20 or 30 minutes in acetone, then rinsed in distilled water. The aging tube, stirring rod, and stopper were scrubbed with a hot detergent solution, rinsed with hot tap water, and finally with distilled water.

The air for the bubbles came from a small air pump. It was filtered through a column of cotton wool to remove particles, and then through activated charcoal to remove any organic vapors that might be present.

In order to keep the bubble size constant the same capillary tip was used in all experiments. In a few of the experiments the seawater was split into two parts. A large capillary tip was used in the first sample of seawater, and a small one in the second. Thus two bubble sizes were obtained, and a comparison of two height vs. age curves could be made on the same seawater specimen.

During the first few experiments the surface of the water where the bubbles burst was kept free from surface-active films by providing a near-continuous overflow of the water. This was done by letting water drip slowly into the top of the right-hand branch of the aging tube. Since this is higher than the left-hand branch, all of the overflow of water took place on the left. It was soon found that the ejection heights depended primarily on the age of the bubble, provided the water surface was clean initially, so most of the experiments were done using an overflow supplied by hand periodically from a beaker of water. Only during heavy seas when violent rolling of the ship caused water to spill from the aging tube was the continuous overflow used.

The ejection height of the jet drops was obtained with the naked eye. A transparent, plastic, millimeter scale was placed vertically over the water only 2 to 3 mm away from the vertical path followed by the jet drops. With the use of proper illumination and by observing the drops in forward scattered light against a dark background, it was a simple matter to determine within about one millimeter the drop ejection heights. Although several jet drops are ejected per bubble, time limitations prevented observations on other than the top jet drops. The changes in drop ejection height vs. bubble age for the second the third jet drops are not the same as for the top jet drop, and would make an interesting subject for future study.

With the exception of the few samples collected while the ship was at dock, the seawater samples for the aging tube studies were obtained off the port bow while the ship was underway. A nylon line 5 to 10 m long was attached to a handle on the side of a 4-liter polyethylene container that had been cleaned in the same manner as was the aging tube. A 2-kg lead weight attached to the bottom of the handle provided sufficient mass so that the container could be swung like a pendulum at the end of the line. The container was always swung forward of the bow wave of the ship and dropped into the water. It sank some 10-20 cm beneath the surface, filled with seawater, and was immediately pulled up to deck level where the temperature was recorded. The sample was discarded and a second sample obtained immediately, to be used for the aging tube study. The aging tube runs usually started within an hour after the sample was collected, and took from 1 to 3 hours to complete. In a number of the samples re-runs were made. No significant changes were observed in the samples which were run within 10 to 12 hours of collection. After about a day, however, the aging tube data often bore no resemblance to that obtained during the first few hours after the collection of the water sample.

Since the bubbles produced by a given capillary tip are the same size (an exception will be given later), it is an easy matter to age one bubble after another for varying periods of time to obtain the required ejection height data. Fig. 2 shows the types of curves that are obtained, and the reproducibility of the drop ejection height for a given bubble age. Data were usually obtained out to a bubble age of 120 sec, and in some cases out to 140. Bubble age is measured from the time the bubble leaves the capillary tip until the time it reaches the surface of the water. The time spent at rest on the surface before bursting is referred to as the surface age. On infrequent occasions the ejection height deviated markedly from the general trend of the data points. Since at this time the eye had been focused at a point along the scale where it was expected that the drop would stop rising, peripheral vision was not sufficient to get a reasonably accurate reading of ejection height. Accordingly, a vertical line appears on the graph to show the approximate ejection height. Two such lines appear on Fig. 2 at bubble ages of 50 and 80 sec. Generally the data were obtained by going from shorter to longer-aged bubbles. At the end of the aging tube run the initial data points were rechecked. If there had been any change in bubble size during the course of the experiment, or any change in the dissolved organic material in the seawater, it would show up in a change in the jet drop ejection height. Such changes were never found.

From the time the USNS Hayes was at dock in the York River on 27 July, 1975, until it entered the Irish Sea on 28 August, 73 samples of seawater were tested in the bubble aging tube. The separate presentation of the curves obtained with each of these samples, complete with the data points, seems unnecessary and would take up far too much space. Since the nature of the curves changed from one sample to the next, and often a gradual trend could be seen, it seems much better to present the curves as close together as possible, and without the individual data points. This has been done in Figs. 3a through 3d.

Fig. 3a shows the curves for the first 15 samples of seawater. The vertical axis is in centimeters. The curves have been placed so as to overlap as much as possible in the vertical, yet not so much that the individual curves cannot be easily separated one from the other. Opposite each sample number, and adjacent to the ordinate, is a number which identifies the top jet drop ejection height for that sample. As an example of how to interpret these curves, consider sample No. 1. At a bubble age of 10 sec the jet drop height had decreased to 10 cm, and to just over 4.5 cm at a bubble age of 140 sec. On the other hand, the seawater of sample No. 2 produced such a rapid decrease in jet drop height that it was down to 7 cm in 10 sec, and to 4.5 cm in only 20 sec. The height remained constant at 4.5 cm out to a bubble age of 70 sec where the experiment was ended.

Detailed information for each of the 73 seawater samples shown in Figs. 3a-3d is given in Table 1. This includes the time and date the sample was collected, its temperature, the latitude and longitude, and an estimate of the Beaufort wind force at the time of collection.

As stated above several of the seawater collections were split and tested separately with a different capillary tip. It is clear from Table 1 when this was done. Samples 32 and 33 constitute the first case. Both curves for these samples were obtained with the same seawater. In sample 32 a large capillary tip produced a bubble that ejected the top jet drop nearly 11 cm for a bubble age of about 2 sec, while in the same water (sample 33) a smaller tip produced a smaller bubble, which at an age of 2 sec ejected the top jet drop less than 6 cm.

Several other types of water, other than seawater, were tested in the bubbl aging tube. On both 7 and 11 August, fog water collected by David Bressan with his fog kite was tested for its ability to modify jet drop ejection heights. The results, which were very striking and quite unexpected, are shown in Fig. 4. Instead of ejecting jet drops to a height of 10 cm, which was common with the seawater samples, bubbles of an age of 2 to 3 sec ejected the top jet drop to a height of only 5 to 6 cm.

It will be noted on Fig. 3d that starting with sample 59 and continuing on through the rest of the samples, the maximum drop ejection height decreases successively with each sample. In sample 73 it is not much more than 5 cm. This was caused by some as-yet-unexplained decrease in bubble size from the large capillary tip.

In February 1974 similar work with the bubble aging tube was carried out aboard the Hayes during a cruise in the Pacific Ocean in the vicinity of the Galapagos Islands. For the sake of completeness and for the purpose of comparing data from the two oceans, the Galapagos data are presented in Fig. 5 and Table 2.

Table 1. Data relevant to the seawater samples collected during the North Atlantic Ocean cruise of the USNS Hayes, July-August 1975.

Sample Number	Sample Collection Time and Date: Local Time	GMT	Specific Location: North Lat.	West Long.	General Location	Sample Temp. (^{o}C)	Beaufort Wind Force
1	0900	1300 27 Jul.	37^{o}18'	76^{o}35'	York River	26.5	
2	0715	1115 28 "	37 18	76 35	" "	25.5	
3	0900	1300 29 "	37 10	75 8	C. Bay Light	24.5	3-4
4	1220	1620 29 "	37 26	74 32	Cape May	25.0	2
5	2006	0006 30 "	38 17	72 53	" "	25.2	
6	0900	1300 30 "	39 45	69 56	Georges Bank	22.0	2
7	0850	1250 31 "	42 40	65 55	" "	13.3	3-4
8	1415	1815 31 "	42 42	65 14	" "	13.6	2-3
9	0845	1245 1 Aug.	42 59	65 53	Off Nova Scotia	11.0	2
10	1825	2225 1 "	43 24	64 7	" " "	13.8	
11	0700	1100 2 "	42 51	62 40	" " "	17.1	1-2
12	1740	2140 2 "	43 39	63 56	" " "	11.0	
13	0900	1300 3 "	43 51	64 00	" " "	10.3	2
14	1810	2210 3 "	44 44	61 49	" " "	11.8	3-4
15	1335	1735 4 "	44 26	62 1	" " "	10.7	3-4
16	1755	2155 4 "	44 16	61 52	" " "	12.1	4
17	1225	1625 5 "	44 5	62 53	" " "	13.9	2
18	1449	1849 6 "	43 56	62 29	" " "	17.1	1-2
19	1500	1900 6 "	43 55	62 31	" " "	17.4	1-2
20	0845	1245 7 "	44 48	58 46	" " "	16.7	2
21	1230	1630 7 "	44 45	57 39	" " "	15.8	
22	0840	1140 8 "	44 40	55 50	Grand Banks	16.0	2
23	1255	1555 8	45 16	55 56	" "	15.1	
24	0915	1215 9 "	44 58	56 46	" "	16.1	2
25	1238	1538 9 "	45 25	56 37	" "	16.1	2
26	1502	1802 9 "	45 25	56 5	" "	16.5	1
27	0828	1128 10 "	43 45	56 25	" "	19.1	2
28	0950	1250 10 "	43 57	56 25	" "	19.2	2
29	1043	1343 11 "	44 53	60 7	Off Nova Scotia	16.6	2

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MARINE FOG CRUISE, USNS HAYES, 29 JULY-28 AUGUST, 1975,(U)
1975 S G GATHMAN, R E LARSON

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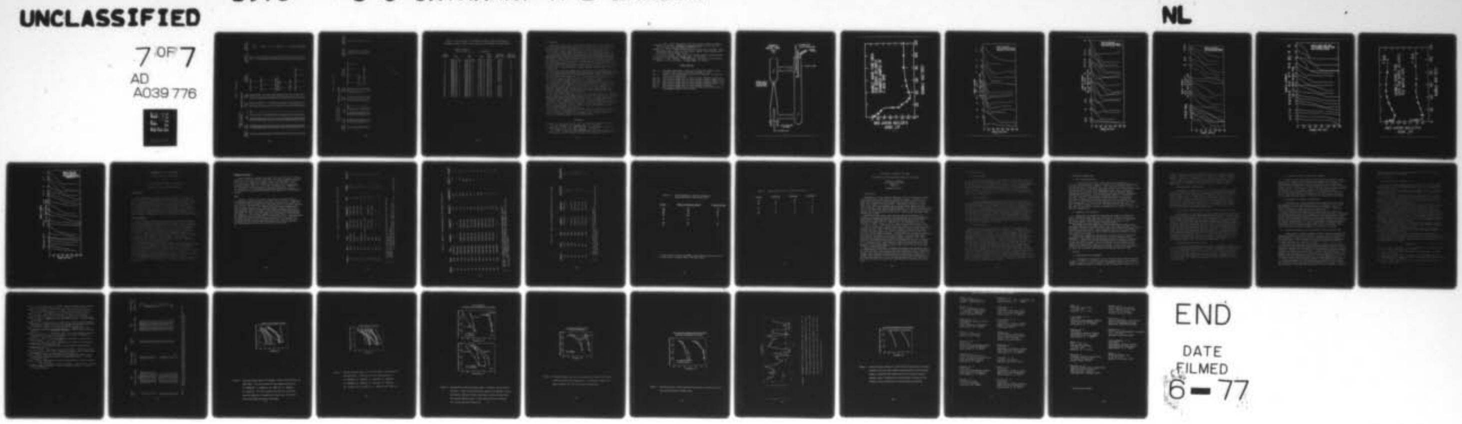

END
DATE
FILMED
6-77

Table 1 (Continued-)

Sample Number	Sample Collection Time and Date: Local Time	Sample Collection Time and Date: GMT		Specific Location: North Lat.	Specific Location: West Long.	General Location	Sample Temp. (^{o}C)	Beaufort Wind Force
30	1300	1600	12 Aug.	44°42'	63°40'	Halifax Harbor	16.6	
31	1040	1340	14 "	44 42	63 40	" "	17.3	1
32	0830	1130	15 "	44 42	63 40	" "	17.5	1-2
33	0830	1130	15 "	44 42	63 40	" "	17.5	1-2
34	0900	1200	16 "	44 42	63 40	" "	16.3	
35	0900	1200	16 "	44 42	63 40	" "	16.3	
36	0835	1135	17 "	44 00	62 43	Off Nova Scotia	17.7	1
37	1307	1607	17 "	43 56	63 6	" " "	17.7	1-2
38	1800	2100	17 "	44 7	62 11	" " "	19.3	3
39	0837	1137	18 "	44 4	62 11	" " "	18.5	4
40	1219	1519	18 "	44 3	62 56	" " "	17.5	3
41	1219	1519	18 "	44 3	62 56	" " "	17.5	3
42	0847	1147	19 "	44 36	60 45	" " "	18.0	4
43	0847	1147	19 "	44 36	60 45	" " "	18.0	4
44	1213	1513	20 "	44 35	63 30	Halifax Harbor	16.5	4
45	0849	1149	21 "	44 45	57 00	Off Nova Scotia	17.0	4-5
46	1257	1557	21 "	44 47	56 20	Grand Banks	17.4	4-5
47	1512	1812	21 "	44 49	55 44	" "	15.7	4-5
48	0847	1147	22 "	45 20	50 20	" "	15.7	4
49	1050	1350	22 "	45 30	49 45	" "	16.0	4
50	1520	1820	22 "	45 55	48 40	" "	15.6	4
51	1745	2045	22 "	46 7	48 5	" "	15.2	3
52	0900	1200	23 "	47 18	43 40	Flemish Cap	14.6	3
53	1237	1537	23 "	47 40	42 35	" "	15.4	4-5
54	1505	1805	23 "	47 48	42 5	" "	17.0	5
55	0905	1105	24 "	49 00	37 25	North Atlantic-deep water	17.8	4-5
56	1210	1410	24 "	49 12	36 20	" " " "	17.4	5
57	1800	2000	24 "	49 35	34 15	" " " "	15.5	6-7
58	0910	1110	25 "	50 18	29 32	" " " "	14.5	4-5
59	1250	1450	25 "	50 24	28 15	" " " "	14.6	3-4
60	1600	1800	25 "	50 32	27 10	" " " "	15.7	3-4

Table 1 (Continued-)

Sample Number	Sample Collection Time and Date: Local Time	Sample Collection Time and Date: GMT		Specific Location: North Lat.	Specific Location: West Long.	General Location	Sample Temp. (^{o}C)	Beaufort Wind Force
61	0855	0955	26 Aug.	51° 3'	21°38'	North Atlantic-deep water	15.7	2
62	1120	1220	26 "	51 6	20 57	" " " "	15.2	2
63	1400	1500	26 "	51 10	20 8	" " " "	16.0	3
64	1604	1704	26 "	51 12	19 30	" " " "	16.4	3
65	1225	1225	27 "	51 18	12 54	" " " "	16.9	2
66	1345	1345	27 "	51 24	12 27	" " " "	17.0	2
67	1510	1510	27 "	51 24	12 0	Off Ireland	17.5	2
68	1800	1800	27 "	51 26	10 57	" "	17.7	2
69	0830	0730	28 "	51 45	7 8	" "	16.7	1-2
70	1045	0945	28 "	52 0	6 20	St. George's Channel	15.5	1
71	1237	1137	28 "	52 15	6 0	" " "	15.4	1
72	1347	1247	28 "	52 25	5 50	" " "	14.8	1
73	1525	1425	28 "	52 48	5 38	" " "	15.2	1

Table 2. Data relevant to the seawater samples collected during the Galapagos Islands, Pacific Ocean cruise of the USNS Hayes, February 1974.

	Sample Collection Time and Date		Location			
Sample Number	EST	GMT	Lat.	West Long.	Sample Temp. (^{o}C)	Beaufort Wind Force
1	0845 12 Feb.	1345 12 Feb.	5^{o}15' N	89^{o}35'	27.5 C	1
2	0900 13 "	1400 13 "	3 15 N	88 30	26.9	3
3	1225 14 "	1725 14 "	0 55 S	89 5	26.0	3
4	1018 15 "	1518 15 "	1 15 S	90 45	25.7	2
5	1850 15 "	2350 15 "	1 15 S	90 45	26.5	2
6	1015 16 "	1515 16 "	2 10 S	93 10	25.5	2
7	0920 17 "	1420 17 "	0 55 S	94 50	26.3	
8	0900 18 "	1400 18 "	0 35 S	91 25	25.0	2
9	1650 18 "	2150 18 "	0 30 S	91 30	26.2	2
10	0905 19 "	1405 19 "	0 15 N	90 0	25.7	2
11	0830 20 "	1330 20 "	1 50 S	86 50	26.3	2
12	0830 20 "	1330 20 "	1 50 S	86 50	26.3	2
13	1800 20 "	2300 20 "	2 50 S	86 0	25.5	3
14	0900 21 "	1400 21 "	3 30 S	84 15		3
15	1330 21 "	1830 21 "	2 50 S	83 50	23.2	4
16	0910 22 "	1410 22 "	0 10 S	82 5	25.8	3
17	1512 22 "	2012 22 "	1 25 S	82 5	26.0	2
18	0840 23 "	1340 23 "	1 55 S	81 35	25.7	2
19	1315 23 "	1815 23 "	1 30 S	81 25	27.6	3
20	1755 23 "	2255 23 "	2 0 S	81 15	26.6	2
21	1755 23 "	2255 23 "	2 0 S	81 15	26.6	2

3. Comments

Although the primary aim of the papers in this report is to present only the data collected during the North Atlantic cruise of the USNS Hayes in July and August, 1975, a few comments on the data obtained with the bubble aging tube will better enable the reader to draw his own conclusions.

All of the seawater samples shown in Figs. 3a-3d produced a decrease in jet drop ejection height with increasing bubble age. While the curves for each sample were different, it is evident that at times a similarity can be observed for samples collected within a day or two of each othe . For example, the curves of samples 7-13 (31 July-3 August) all show a rapid decrease in ejection height reaching a minimum at a bubble age of 20 to 40 sec, followed by a slow increase for larger ages. Samples 47-54 (21-23 August) showed a knee or bump in the curve that appeared at nearly 100 sec in sample 47. This moved progressively to lower ages with successive samples, reaching about 35 sec in sample 54.

In all cases where two bubble sizes were used in the same seawater, the ejection heights with the smaller bubble showed a much smaller percentage change with bubble age than they did with the larger bubble. This is very obvious in the sample pairs 40-41 and 42-43. A clue to this difference may be in the fact that the speed of bubble collapse and the ejection velocity of the jet drops is an inverse function of bubble size (Blanchard, 1963).

In addition to the data shown in Figs. 3a-3d observations were made on the surface age of the bubbles. As explained earlier this is the time spent by the bubble at the surface of the water before bursting. In general it was found that for bubble ages in excess of about 5 sec the surface age was relatively constant, and, depending upon the seawater sample, from a few tenths to several seconds. For a bubble age of less than 5 sec the surface age was from several seconds to 10 or more.

The curves for the fog water, Fig. 4, show that with about 2 to 3 sec bubble aging the jet drop ejection heights were only about 5 cm. It was not possible to get lesser ages by raising the capillary tip in the bubble aging tube. If a different type of apparatus had been used to work with bubbles of an age of 0.1 sec or less, then quite likely the drop ejection height would have been about 10 cm. The rapid decrease in height in only a few seconds, similar to that for seawater sample 15, must indicate a high concentration of surface-active organic material in the water.

The data for the Pacific Ocean seawater (Fig. 5) is similar to that for the Atlantic waters, though differences can be noted if they are closely compared. With the exception of sample 14, all samples from 12 on were tested with a capillary tip which produced relatively small bubbles.

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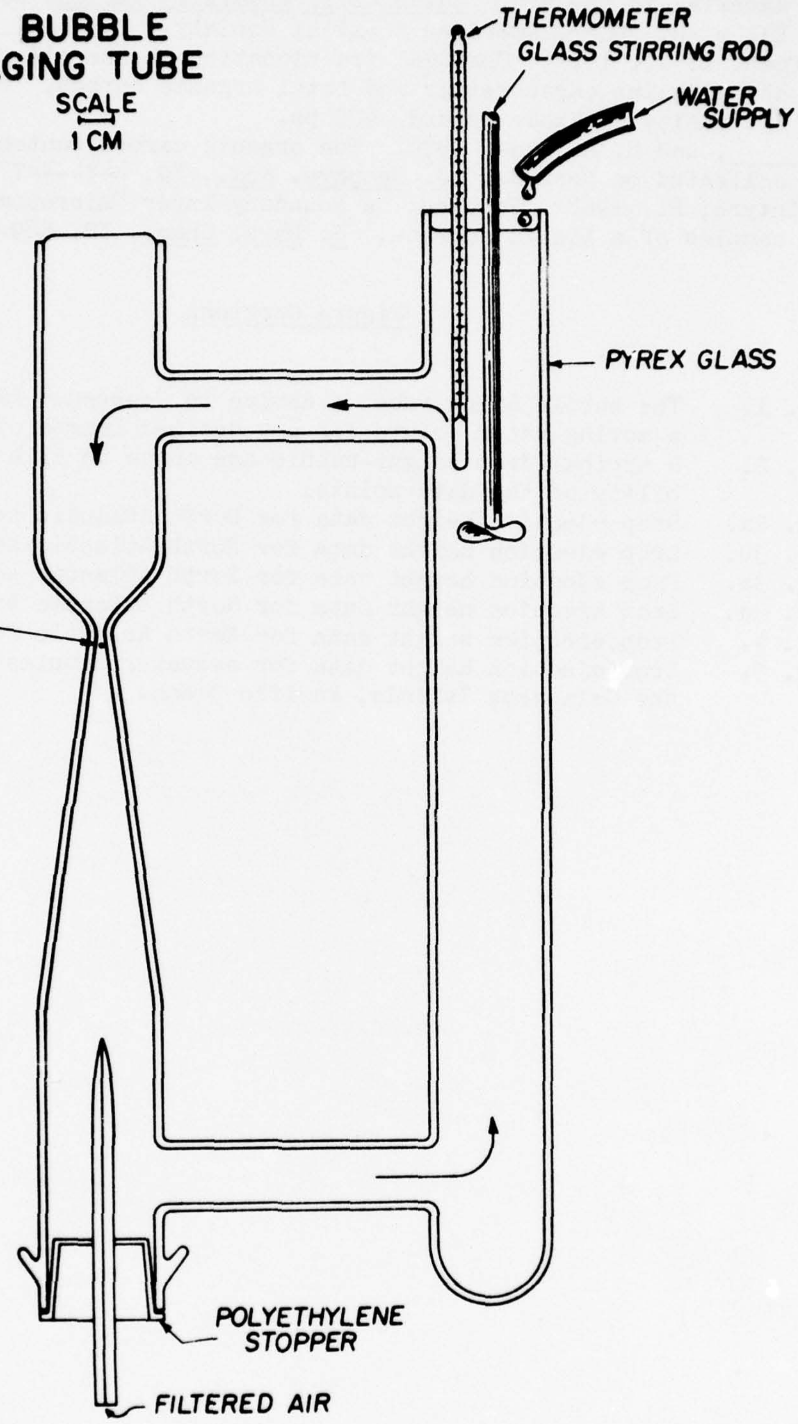
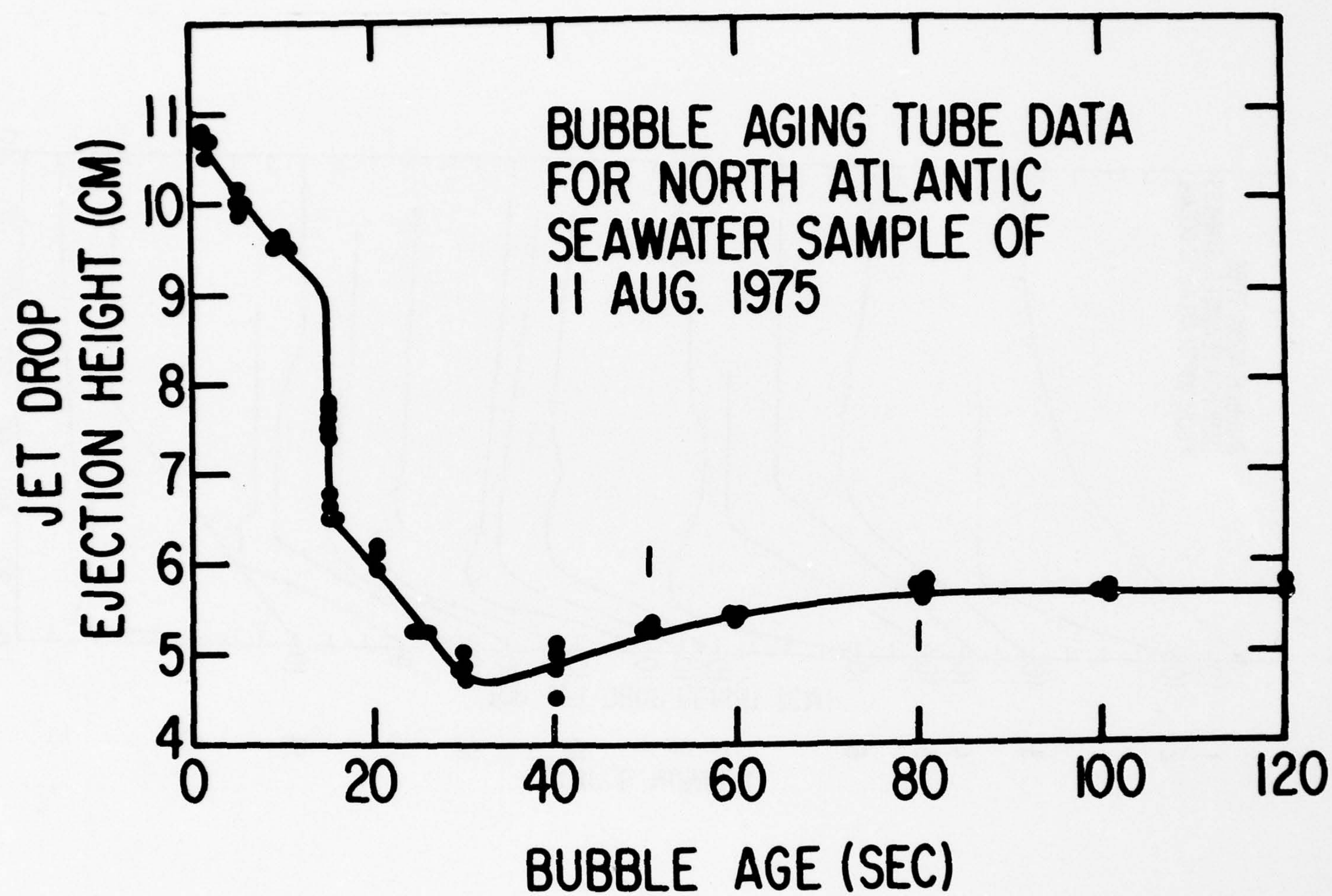
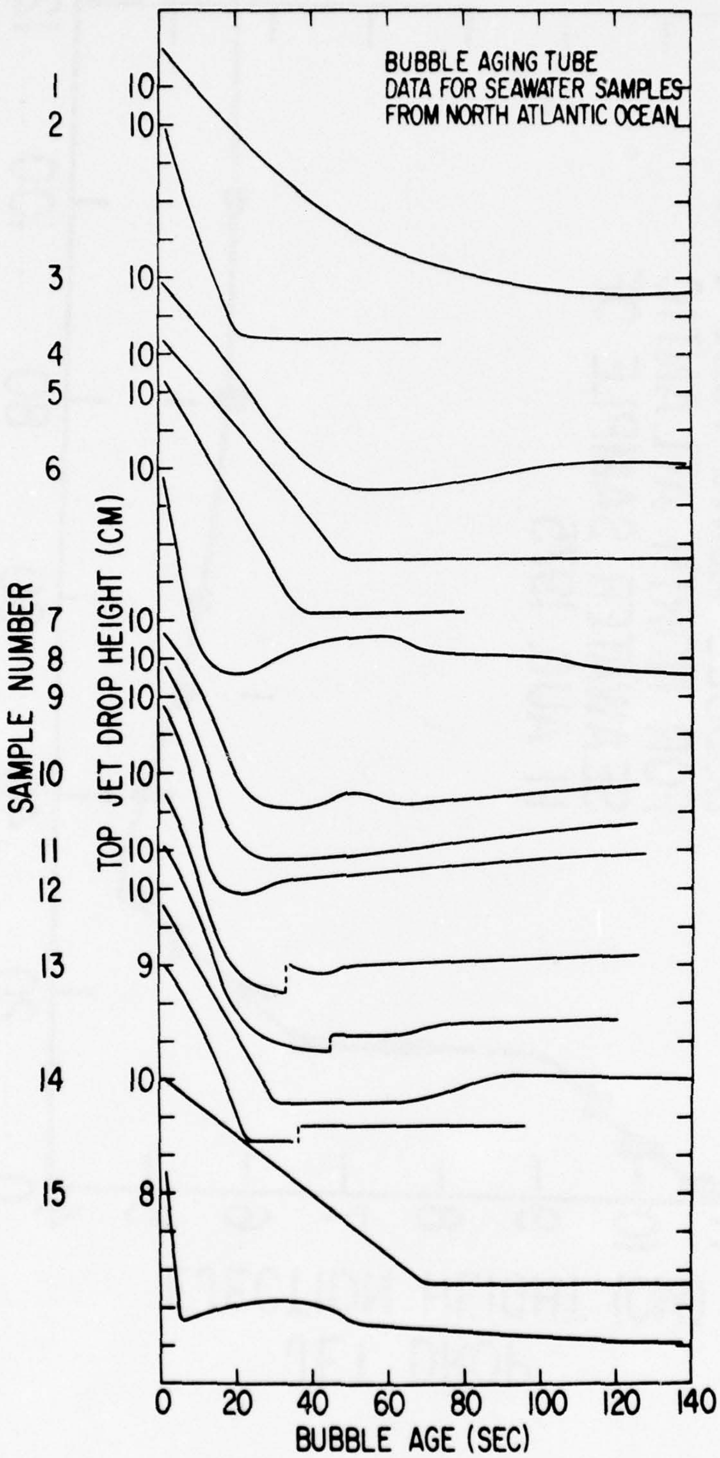
Figure Captions

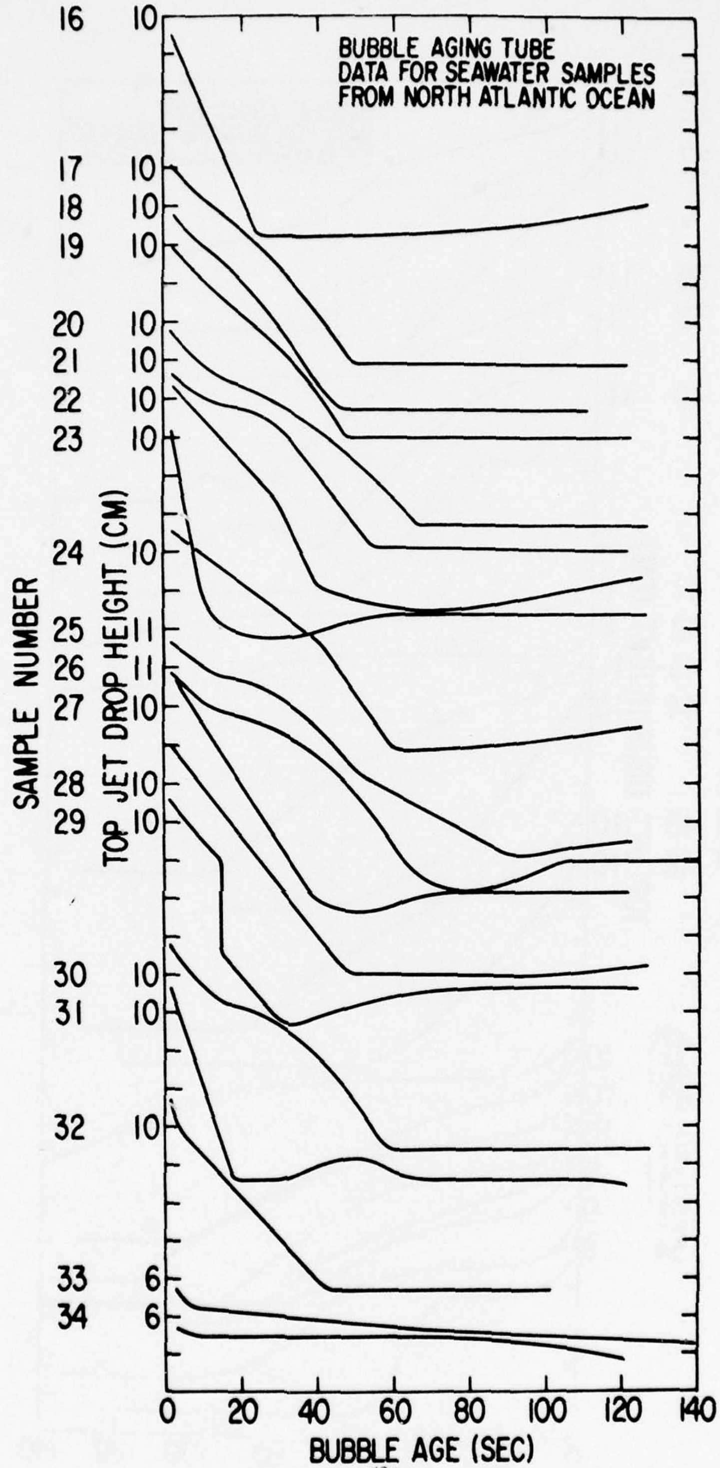
BUBBLE AGING TUBE

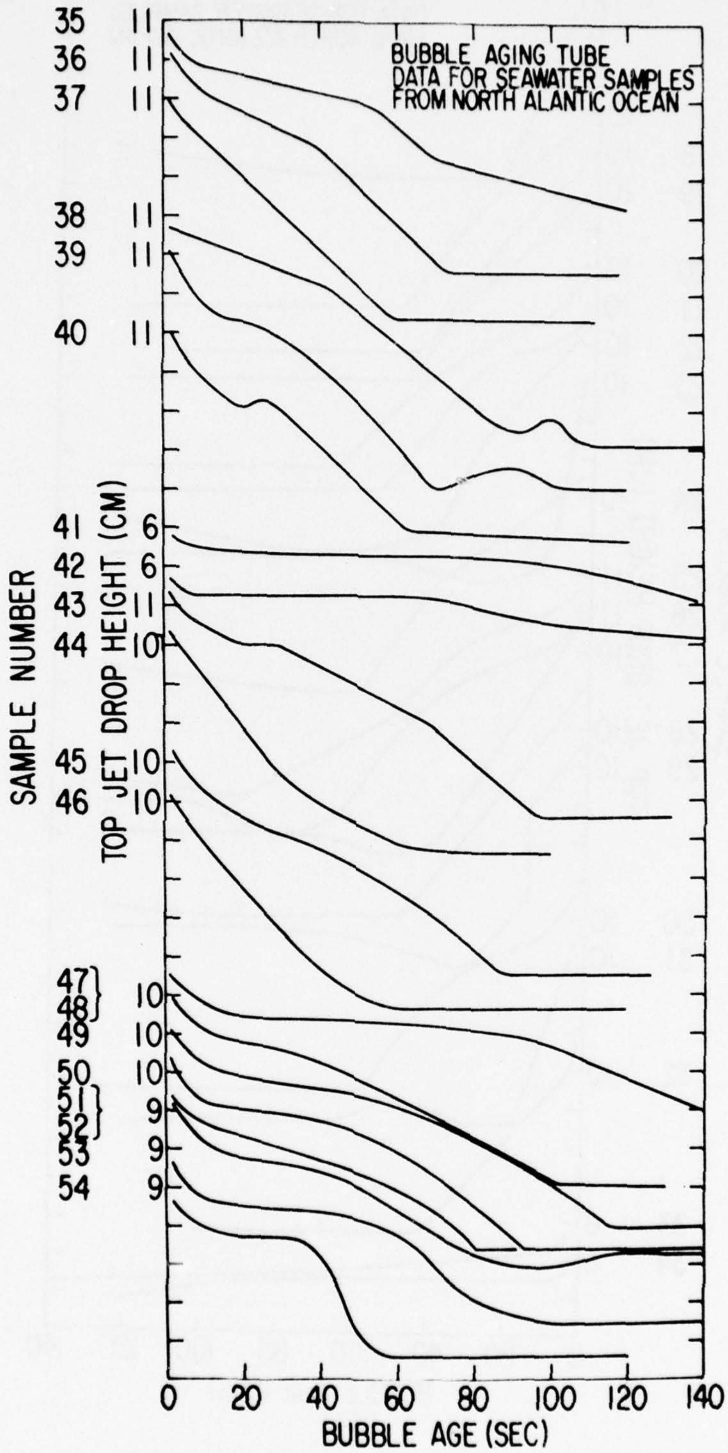




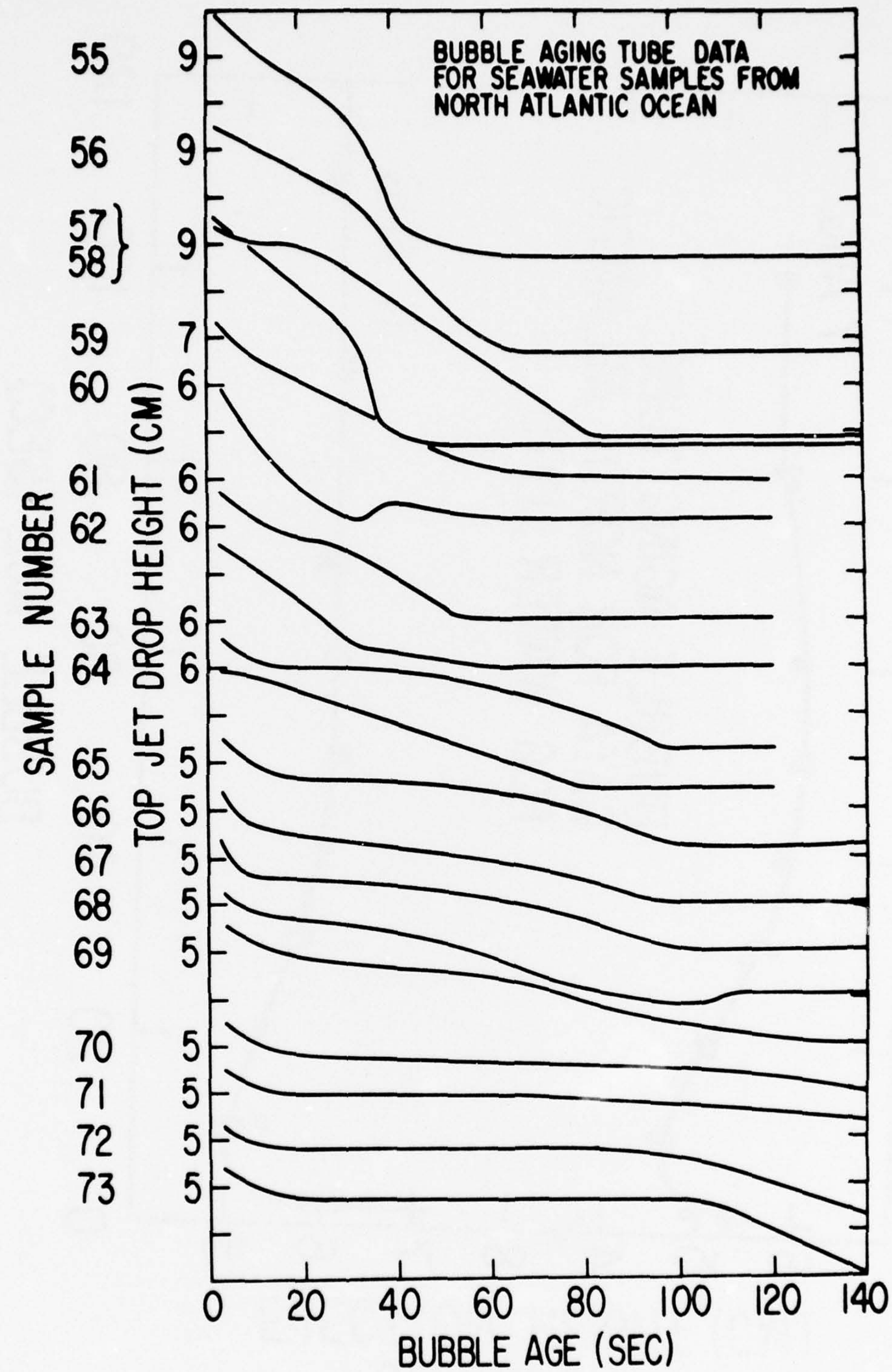
BUBBLE AGING TUBE DATA
FOR NORTH ATLANTIC
SEAWATER SAMPLE OF
11 AUG. 1975
JET DROP
EJECTION HEIGHT (CM)
BUBBLE AGE (SEC)
4
5
6
7
8
9
10
11
0
20
40
60
80
100
120

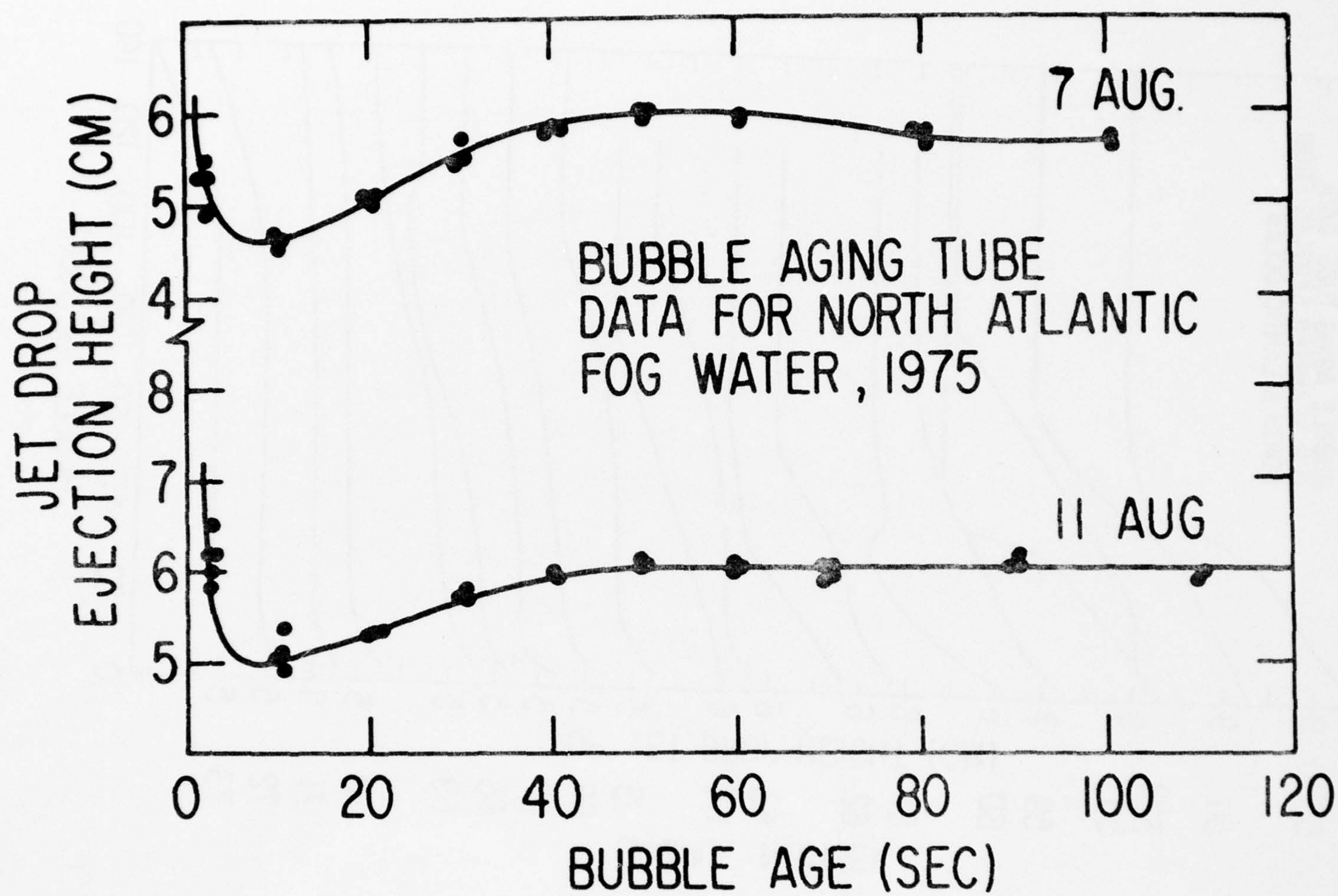

BUBBLE AGING TUBE
DATA FOR SEAWATER SAMPLES
FROM NORTH ATLANTIC OCEAN
SAMPLE NUMBER
TOP JET DROP HEIGHT (CM)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
10
9
8
0
20
40
60
80
100
120
140
BUBBLE AGE (SEC)

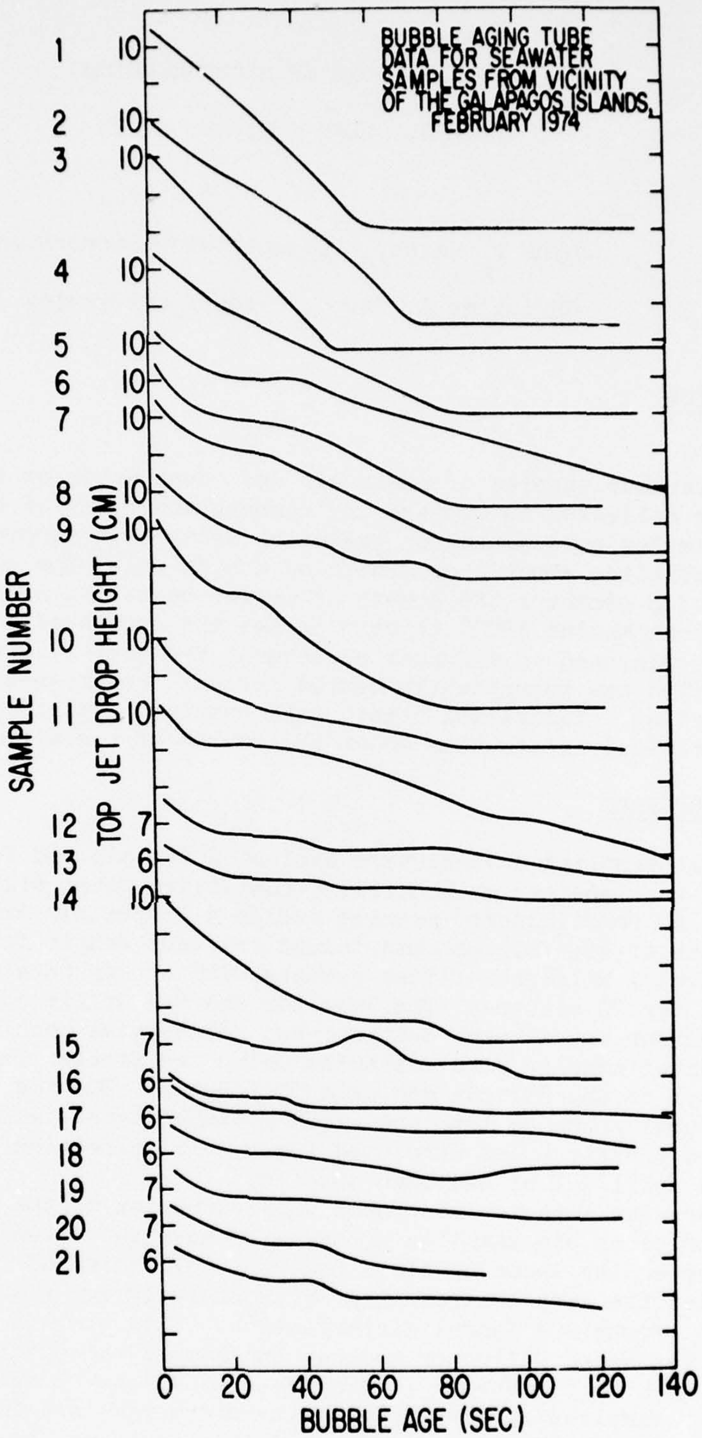

BUBBLE AGING TUBE
DATA FOR SEAWATER SAMPLES
FROM NORTH ATLANTIC OCEAN
SAMPLE NUMBER
TOP JET DROP HEIGHT (CM)
BUBBLE AGE (SEC)
0
20
40
60
80
100
120
140
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
10
11
6



BUBBLE AGING TUBE
DATA FOR SEAWATER SAMPLES
FROM NORTH ALANTIC OCEAN
SAMPLE NUMBER
TOP JET DROP HEIGHT (CM)
35 11
36 11
37 11
38 11
39 11
40 11
41 6
42 6
43 11
44 10
45 10
46 10
47
48 10
49 10
50 10
51
52 9
53 9
54 9
0 20 40 60 80 100 120 140
BUBBLE AGE (SEC)


BUBBLE AGING TUBE DATA
FOR SEAWATER SAMPLES FROM
NORTH ATLANTIC OCEAN
SAMPLE NUMBER
TOP JET DROP HEIGHT (CM)
55 9
56 9
57
58 9
59 7
60 6
61 6
62 6
63 6
64 6
65 5
66 5
67 5
68 5
69 5
70 5
71 5
72 5
73 5
0
20
40
60
80
100
120
140
BUBBLE AGE (SEC)


7 AUG.
BUBBLE AGING TUBE
DATA FOR NORTH ATLANTIC
FOG WATER, 1975
11 AUG
JET DROP
EJECTION HEIGHT (CM)
BUBBLE AGE (SEC)
0
20
40
60
80
100
120
6
5
4
8
7
6
5



BUBBLE AGING TUBE
DATA FOR SEAWATER
SAMPLES FROM VICINITY
OF THE GALAPAGOS ISLANDS,
FEBRUARY 1974
SAMPLE NUMBER
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
TOP JET DROP HEIGHT (CM)
10
10
10
10
10
10
10
10
10
10
10
7
6
10
7
6
6
6
7
7
6
0
20
40
60
80
100
120
140
BUBBLE AGE (SEC)

ENUMERATIONS OF MICROORGANISMS

IN FOG, CLEAR AIR, AND WATER

by

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Christine E. Carty, Rutgers University

INTRODUCTION

Simultaneous samples of clear air and ocean water or fog and ocean water were collected to compare the numbers and types of bacteria and fungi. Samples were plated on selective media to determine the percent of the population capable of growth on a high salt, low nutrient medium (MSWYE) which promotes the growth of marine bacteria, on a low salt, high nutrient medium (PCA) which promotes the growth of soil and fresh water bacteria, and on a fungal enrichment medium (F). Over 450 strains were purified and subsequently tested for salt requirement and Gram stain reaction. Individual strain data combined with the distributional studies provided information about the source of the airborne microorganisms.

SAMPLING DEVICES

Several sampling devices were evaluated for air and fog collection. Clear air was impacted on a nutrient-containing petri dish or a paper filter (0.45 um Millipore) mounted inside a Forced Air Impactor (Bressan). A flow rate of $66m^3$/min was maintained for each sample for 15 minutes. Alternatively, Millipore filter devices with a pump rate of $10m^3$/min were used for 20 minutes. The Impactor and the Millipore devices were sterilized for use at each station, but not between each sample.

Fog water samples were collected using the Bressan Impactor described previously, or the Calspan Fog Water Collector. The Fog Water Collector, a centrifugal force device, was alcohol washed before each use, and sterilized plastic tubes were used for sample collection. Sampling was continued until 5-7 ml had been obtained.

The Bressan Impactor was found to be superior to the Millipore filter device for clear air sampling probably because the extended Millipore filter cup deflected the incoming air. However, collection of fog samples on plates with the Impactor resulted in excessively wet plates causing confluent growth and fungal contamination. This problem was not encountered with the Fog Water Collector because the sample was collected as a liquid and subsequently filtered. The Fog Water Collector provided a satisfactory method for sampling and enumerating the microorganisms in fog.

Ocean water samples were collected at a depth of one meter using sterile Niskin bag samplers. Volumes from 1 to 100 ml were filtered (0.45 um Millipore).

ENUMERATION METHODS

Several enumeration methods including filtration, impaction on filters and plates, and direct plating, were used. All samples, whether resulting from filtration, impaction, or direct plating were enumerated on Marine Salt Water Yeast Extract Agar (MSWYE), Plate Count Agar (PCA), and Sabouraud Dextrose Agar (F). Plates were incubated at room temperature, and the resulting colonies counted at three and seven days. Because of the low numbers of microorganisms, enumeration methods which employed a concentration step, such as filtration, were superior to direct counting methods.

DATA

The data in Tables I, II, and III show that the concentrations of microorganisms were much higher in the water than in the air. Comparisons of organisms growing on medium with high salt concentrations (MSWYE) and with low salt concentrations (PCA) clearly show that more airborne organisms were recovered on the low salt medium, while waterborne organisms were found in higher numbers on the high salt medium. Between 52 and 80% of the waterborne cultures isolated on salt-containing medium demonstrated a requirement for salt, while fewer than 10% of the airborne microorganisms did (Table IV). These results suggest that the majority of the airborne microorganisms were of terrestrial, and not marine, origin. This conclusion is supported by the Gram stain results (Table V) which show a definite difference between the water and airborne bacteria. In contrast to the predominately Gram negative marine population, the airborne population was predominately Gram positive, as are most soil bacteria.

Table I. Number of Microorganisms per Cubic Meter of Fog

Station	Date	Time	Latitude	Longitude[a]	PCA[b]	MSWYE[b]	Method[d]
1F	8/2-3	2330-0030	43°47.2'N	66°33.1'W	5	0.5	I
2F	8/3	1112-1230	44° 4.9'N	63°27.5'W	56	12	F
3F	8/3	1755	44°42.5'N	61°53.5'W	C[c]	4	F
4F	8/4	0900-1100	44°29.8'N	62° 3.0'W	5.3	0.5	I
5F	8/4	Turned to Clear Air = 10A			10	3	F
7F	8/6	0115	45° 9.0'N	59°28.6'W	1.7	7	F
9F	8/7	1900	45° 4.0'N	56° 1.4'W	8	0	F
10F	8/8	0100	---	---	C	C	I
11F	8/9	0030	---	---	1.1	0.2	F

a Position at beginning of sampling period per NRL computer printout.
b Average of 1 to 4 plates.
c Contaminated or confluent growth.
d Method: I = Bressan Forced Air Impactor, 15 min @ 66 c.f.m.
F = Calspan Fog Water Collector, calulated from 0.2 cc water = 1 cubic meter air

Table II. Number of Microorganisms per Cubic Meter of Clear Air

Sample	Date	Time	Latitude	Longitude[a]	PCA($X10^{-1}$)	MSWYE($X10^{-1}$)	F($X10^{-1}$)	Method[b]
1A	7/29	0830-1100	---	---	1.4	2.3	9.5	I
2A	7/30	0815-1015	---	---	1.9	0.5	5	I
3A	7/30	1700-1930	40°42.8'N	68° 6.9'W	1.4	0.4	5.2	I
4A	7/31	0815-1015	42°34.3'N	65°54.9'W	2.3	0.8	105	I
5A	8/1	1900-2130	43°16.6'N	64° 8.7'W	5.7	1.4	120	I
6A	8/1-2	2330-0200	42°26.5'N	64° 7.9'W	0.4	1.9	87	I
7A	8/3	1445-1530	44°26.1'N	62°35.9'W	C[c]	C	-	I
8A	8/3-4	2330-0130	44°14.5'N	64°16.1'W	42.0	5.3	-	M
9A	8/4	1400-1545	44°26.0'N	61°44.7'W	11.9	1.8	-	I
10A	8/4	1700-1930	44°16.0'N	61°37.3'W	C	C	-	I
11A	8/6	1300-1530	44° 6.8'N	62° 0.3'W	6.6	0	-	I
12A	8/7	1427-1600	44°44.3'N	57° 2.5'W	4.2	C	-	I
13A	8/8	1400-1600	---	---	14.2	C	-	M

a Position at beginning of sampling period per NRL Computer Printout.
b Methods: I = Bressan Forced Air Impactor, 15 min @ 66 c.f.m.
MF= Millipore Filter Device with Vacuum Pump, 20 min @ 10 c.f.m.
c Contaminated or confluent growth.

Table III. Number of Microorganisms[a] per Cubic Meter of Water

Station	Date	Time	Latitude	Longitude	PCA($X10^6$)[c]	MSWYE($X10^6$)[c]
1W	7/29	1030	37°16.9'N	74°53.3'W	1	16
2W	7/30	0930	---	---	0[b]	2
3W	7/30	1800	40°43.7'N	68° 4.7'W	5	3
4W	7/31	0930	42°48.0'N	65°56.2'W	1	1.4
5W	8/1	2000	43° 4.8'N	64° 9.4'W	0[b]	0.6
6W	8/2	0030	42°17.1'N	64° 6.3'W	1	3
7W	8/4	1030	44°27.2'N	61°50.2'W	4	17

a Fungi were not detected in any 100 ml water samples.
b Zero values per 100 ml cannot be extrapolated to zero values per cubic meter.
c Average values of 3 plates.

Table IV. Salt Requirement of Bacteria Isolated on Marine Salt Water Yeast Extract Agar

Station	Number of Isolates Tested[a]	% Requiring Salt
1W	75	71
3W	80	52
4W	70	67
6W	50	80
7W	100	77
9A	17	1
4F	40	8
11F	21	10

[a] After initial isolation on MSWYE, strains were purified and tested for the ability to grow on PCA, a low salt medium.

Table V. Gram Stain Reactions of Individual Isolates

Station	% Positive	% Negative	% Variable
1W	9	90	1
3W	26	69	5
7W	21	73	6
9A	76	6	18
4F	71	29	0
11F	56	30	14

ICE NUCLEI IN SEAWATER, FOG WATER

AND MARINE AIR DURING THE USNS HAYES 1975 FOG CRUISE

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1. Introduction

Atmospheric ice nuclei play an important role in the initiation of much of the precipitation that falls on the earth's surface. The sources for these rare yet pivotal particles have most often been thought to be soil particles of extraterrestrial meteoritic materials (Isono et al., 1959; Kumai, 1961; Bowen, 1956; Bigg, 1963). More recently, Schnell and Vali (1972, 1973, 1976) have presented strong evidence that decayed litters from terrestrial plants release copious amounts of ice nuclei in concentrations of up to 10^9 nuclei per gram of leaf litter active at -10C, and some litters exhibit this ice nucleation activity at -4C. These nuclei are called leaf-derived nuclei (LDN).

Another source of very active ice nuclei has been observed to be a function of the intact bodies of a very few species of terrestrial bacteria. Specifically, *Pseudomonas syringae, Pseudomonas fluorescens,* and *Erwinia herbicola* have been observed to initiate ice in supercooled water at temperatures warmer than -3C. (Maki et al., 1974; Lindow et al., 1974; Vali et al., 1976). These nuclei are called bacteria-derived nuclei (BDN).

Within the marine environment, a prolific source of ice nuclei has been observed in close association with marine waters of high primary productivity (Schnell and Vali, 1974). For instance, waters off Bedford, Nova Scotia, produced ice nuclei active at -3.5C in concentrations of up to 10^7 nuclei active at -10C per gram of plankton. Marine waters of low primary productivity were observed to contain few ice nuclei (*ibid).* In keeping with earlier nomenclature, these nuclei are called ocean-derived nuclei (ODN). ODN have been successfully grown *in vitro* in concentrations of up to 10^6 nuclei active at -10C per gram of plankton with some first ice embryos detectable at -3C (Schnell, 1975). More recently, a marine bacterium living in close association with phytoplankton has been shown to be an active ice nucleant (Schnell, unpublished to date).

Based on this information, shipboard measurements were conducted during the USNS HAYES 1975 Fog Cruise to monitor the presence of ODN in seawater, in air above the water, and in marine fog water encountered during a trip which crossed areas of generally high primary productivity east of Nova Scotia, Canada. The research procedures utilized to conduct these measurements, the data gathered, and an analysis of the results form the body of this report. All times referenced are local ship times taken from the ship's dining hall clock.

2. Sample Collection

a. Seawater Samples

Seawater was collected off the starboard side and stern of the ship by dipping a rope-lowered plastic bucket into the top half meter of the sea surface. Most of the seawater samples were collected by Duncan Blanchard for his bubble-breaking experiments, thus making comparisons between the ice nucleus activity and bubble-breaking activity of the same seawater volumes possible. The remainder of the seawater samples were obtained at 1 to 3 meter depths by bottle collections conducted by Jayne Carney and Chris Carty. Seawater was tested for its ice nucleus content two or three times in each 24-hour period.

b. Fog Water Samples

Fog water samples were obtained by Gene Mack and Ulrich Katz of Calspan who operated a centrifugal collecting device at a point high above the deck near the bow of the HAYES, and by Dave Bresson of NRL who collected fog water utilizing a bow kite. Many of these samples are duplicates, portions of, or in sequence with fog water samples tested by Robert Baier of Calspan for infrared-detectable components and surface-active components. Control washes and ice nucleus spectra comparisons of samples collected by the two techniques indicated that there was no contamination in samples collected by the centrifugal system and only slight residual contamination from the bow kite, the latter being considered insignificant. Due to the one-man operation of the ice nucleus measurements, fogs occurring between 2400 and 0800 were generally not tested.

c. Membrane Filters

Membrane filters (0.45 μm, Millipore, HAWG, 3.7 cm diameter) were exposed in pairs from a position below and forward of the Calspan tower on the uppermost deck of the HAYES. Air was drawn through a coiled plastic hose (2 m length, 2 cm diameter) into a bifurcated chamber where the membrane filters (in their plastic holders) were mounted. This sampling arrangement allowed spray, rain, and fog droplets to fall out prior to passage of air through the filters. A constant airflow of 700 liters per hour was maintained through each filter. Undoubtedly, some very small particles were lost by diffusion while passing through this system.

Measurements of possible contamination by the ship's exhaust plumes from galley and engines were conducted by purposely exposing the filters to the effluent streams. No ice nuclei from either source were observed. In order to produce field exposed control filters, no air was drawn through every tenth pair of filters mounted on the sampling apparatus. These filters were later processed to obtain a mean ice nucleus background count, which subsequantly was subtracted from each observed count to obtain a true count. For data presented in this report, a background correction of 10 ice nuclei per filter active at -15C was used.

3. Ice Nucleus Measurements

a. Drop Freezing Technique

It has been shown by Vali (1971a) that the concentrations of suspended freezing nuclei in samples of water can be determined quantitatively by using the drop freezing technique. This technique involves placing equal-sized drops on a thermally controlled surface (cold stage) and monitoring the freezing of the drops as the temperature of the sample is gradually lowered. Nucleus spectra can be constructed from the observed freezing temperatures of the drops. The particular cold stage for these experiments consisted of a copper fin and plate arrangement immersed in crushed dry ice (Vali, 1971b). During cooling of the cold-stage, freezing events were detected visually as the drops changed from clear to opaque upon freezing. To characterize the nucleating ability of a sample, the freezing point temperatures, T_1, T_{10}, T_{90}, and T_{100} were noted for the first 10%, 90%, and 100% of 30 drops in a test. For the drop sizes used, T_1, T_{10}, T_{90}, and T_{100} correspond to nucleus concentrations of 0.9 cm^{-3}, 8.3 cm^{-3}, and 380 cm^{-3}, respectively.

b. Membrane Filter Technique

Deposition ice nucleation occurs when ice forms on a nucleus by direct transfer of water vapor onto that nucleus. This process can occur below, at, or above water saturation, but only at or above ice saturation. The filter membrane technique is used to measure ice nuclei in the deposition mode utilizing a thermal diffusion chamber.

The thermal diffusion chamber is a widespread laboratory device used to measure deposition nucleation (Bigg et al., 1963; Gagin and Aroyo, 1969). The chamber utilized in this study was as described by Langer and Rodgers (1975) except for one modification: three thermally controlled ice covered plates were substituted for the ice cubes utilized by Langer and Rodgers to supply water vapor to the nuclei.

The diffusion chamber was calibrated to provide moisture to the nuclei suspended on the membrane filters at rates at or just exceeding water saturation. These rates were periodically checked by observing a fog formed on tin foil inserted in place of the filters and by the presence of halos around growing ice crystals. This is indicative of both the presence and removal of condensed water vapor on the filters. In this study, all data presented are for filters processed at -15C and corrected for volume effects by use of the correction curve derived by Mossop and Thorndike (1966).

4. Results

a. Freezing Nuclei in Seawaters

Representative spectra for all the seawater samples tested are shown in Fig. 1. From Fig. 1 it may be seen that a large majority of the seawater samples contained ice nuclei inactive at temperatures warmer than -14C. Five seawater samples contained ice nuclei active at temperatures warmer than -10C,

including the phenomally active spectrum designated 1, collected at 0900, 8 August. Spectrum 1 is the most active I have ever observed for ambient seawater. Spectrum 5, collected at 2300, 4 August, is anomalous in that its very shallow slope indicates that the sample contained many ice nuclei active at warmer temperatures and relatively few ice nuclei at colder temperatures. Repeat tests of this sample produced similar results.

b. Freezing Nuclei in Fog Waters

Representative spectra for all of the fog waters tested are shown in Fig. 2. This figure shows that fogs generally contained more ice nuclei than seawaters and that the most active fog water tested was collected at 0845, 8 August, just 15 minutes prior to collection of the most active seawater sample (Fig. 1). The fog waters collected between 0600 and 0930, 6 August, also exhibited consistently high ice nucleus concentrations. These spectra represent what I believe to be the first published data on ice nucleus concentrations in marine fogs. In keeping with the earlier nomenclature applied to biogenic ice nuclei, I have given nuclei present in fog water the name fog-derived nuclei (FDN).

c. Relationships Between Freezing Nuclei in Seawaters and Fog Waters

During periods of fog water collection attempts were made simultaneously to collect seawaters in order that comparisons could be made between fog water and seawater freezing nuclei spectra from similar locations. It was observed that on some occasions freezing nucleus concentrations in fog water mirrored freezing nucleus concentrations in seawaters immediately beneath the fogs. As Fig. 3a indicates, this coincidence was observed for both high concentration (8 August) and low concentration (31 July) cases. On the other hand, Fig. 3b shows that there were cases where fog water contained considerably more ice nuclei than associated seawaters (August 6) and where fog waters contained fewer ice nuclei than associated seawaters (August 2). The remaining fog water-seawater spectra pairs exhibited relationships which covered the full range from mirror images to opposites. It should be noted that all spectra for seawaters shown in Fig. 3 have been corrected for a 2C melting point depression induced by salts inherent in seawater. This correction moves the relevant spectra 2C to the right on the abcissas of Fig. 3.

d. Freezing Nucleus Activity Losses

It is known from previous work that ODN in seawater are subject to activity losses during short periods of storage. Theresults of tests designed to monitor changes in ice nucleation activity of ODN and FDN collected on this cruise are shown in Fig. 4. From this, it can be seen that both ODN and FDN lost activity rapidly when stored at ambient ship temperature (in this particular case storage was in 10 cm^3 syringes). Storage of samples in 100 cm^3 and 1000 cm^3 volumes under anerobic and aerobic conditions produced similar results.

e. Ice Nucleus Activity of Fog-derived Bacteria

Jayne Carney and Chris Carty provided me with cultures of bacteria that they had isolated from the earlier fogs sampled on the cruise. These cultures were removed from the nutrient media upon which they grew by gently washing the agar plates with clean distilled water. The freezing nucleus activity imparted to the distilled water by various bacteria cultures is shown in Fig. 5, from which it can be seen that freezing nucleus activity was observed at -1.5C in water suspensions of both salt-requiring and non salt-requiring bacteria species. It is interesting to note that low ice nucleus activity was also exhibited by other cultures of bacteria with the same salt requirements. Studies on the bacteria are continuing.

f. Atmospheric Ice Nucleus Concentrations

Atmospheric ice nucleus concentrations measured during the cruise are tabulated in Table 1 and shown in Fig. 6. From these it can be seen that atmospheric ice nucleus concentrations varied between a high of 580 m^{-3} (filter 12) to lows of 1.1 m^{-3} (filters 21 and 36). The lower limit of ice nucleus detectability was 0.4 nuclei m^{-3}.

Figure 6 indicates that there is no strong correlation between fogs and the presence or absence of atmospheric ice nuclei, but most low atmospheric ice nucleus concentrations (with one exception) are associated with periods of fog. There also does not appear to be any strong relationship between the presence of freezing nuclei in seawaters and/or fog waters and atmospheric ice nucleus concentrations. It will be interesting to compare atmospheric ice nucleus concentrations with radon counts and with atmospheric bacteria concentrations to be found in another chapter of the trip report. High radon counts would suggest the presence of a terrestrial air mass.

g. Infrared Reflectance, Cloud Condensation Nuclei, Plankton Tows

Robert Baier of Calspan performed infrared reflectance analyses upon seawater and fog water samples throughout the trip. Many of these samples were duplicates of samples that I tested for freezing nucleus content. It was interesting to note that samples containing the highest concentrations of freezing nuclei also contained the highest biological (glycoprotein) content of any samples tested on the cruise.

Similarly, the cloud water collected from Vin Saxena's cloud chamber, in which the cloud droplets had formed on natural aerosols, exhibited a good correlation between high freezing nucleus concentrations and high biological content on one hand, (Fig. 7, Curve 1), and low freezing nucleus concentrations and low biological content (Fig. 7, Curve 2) on the other hand. This suggests that some fraction of the freezing nuclei observed on this cruise may either act as condensation nuclei to form cloud droplets, or be closely associated with the particles that do act as cloud condensation nuclei.

Results from tests on material captured in the plankton tows conducted on this cruise suggest that the freezing nuclei observed in the seawaters were a function of the total plankton concentration in the water. Since the experiments were qualitative in nature, due to my inability to accurately

measure and compare different plankton masses, no data on this portion and the research will be presented.

5. Conclusions.

The conclusions are listed below.

(1) About 17% of the seawater samples tested (5 out of 29) contained freezing nuclei active at temperatures warmer than -10C, including some nuclei active at -4C.

(2) About 58% of the fog water samples tested (7 out of 12) contained freezing nuclei active at temperatures warmer than -10, including some nuclei active at -2C.

(3) In some cases, high freezing nucleus concentrations in seawater were mirrored by high freezing nucleus concentrations in associated fog waters, and in some cases they were not. Also, there were cases where fog waters contained high concentrations of ice nuclei and associated seawaters were devoid of any active freezing nuclei.

(4) Storage of active ODN and FDN at ambient room temperature, under both aerobic and anerobic conditions and in volumes from 10 cm^3 to 1000 cm^3, induced rapid losses of freezing nucleation activity in the samples.

(5) Measurements of atmospheric ice nuclei exhibited a wide range of concentrations from 580 down to 1.1 nuclei m^{-3} with considerable variation over the space of a few hours. With one exception, the lowest atmospheric ice nucleus concentrations were observed for measurements within or predominantly within fogs. No firm correlation was noted between the presence of freezing nuclei in seawaters and fog waters on one hand, and atmospheric ice nucleus concentrations on the other.

(6) Some bacteria isolated from fog waters were observed to initiate ice at temperatures warmer than -3C. Other bacteria, similarly isolated, were observed to be very poor ice nucleators.

(7) All the seawater, fog water, and cloud chamber water samples exhibiting high freezing nucleus concentrations also exhibited high concentrations of biological material.

The overall impressions gained from analyzing the data presented in this report are that both land and sea contributed to the ice nucleus concentrations observed, on the cruise, and that many of these ice nuclei are of biological origin. Any further conclusions must await analysis of all the data collected on the cruise.

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TABLE 1

Filter No.	Time (Local Ship Time)	Concentration (Nuclei m^{-3})	Filter No.	Time (Local Ship Time)	Concentration (Nuclei m^{-3})
	July				
1.	1000-1200/30	377	20.	0930-1820/4	1.2
2.	1200-1450/30	323	21.	1820-2330/4	1.1
3.	1450-1800/30	175	22.	0000-0200/4	1.4
4.	2015-2230/30	90	23.	0200-0935/5	43
5.	0915-1145/31	68	24.	0935-2230/5	269
6.	1150-1440/31	172	25.	2230-0845/6	155
7.	1440-1635/31	260	26.	1330-2200/6	100
8.	1635-2005/31	54	27.	2200-0800/7	46
9.	2005-2205/31	73	28.	0800-1800/7	315
			29.	1800-2200/7	1.5
	August		30.	2200-0800/8	100
10.	2205-0930/1	91	31.	0800-2000/8	86
11.	0930-1325/1	149	32	2030-2400/8	3.7
12.	1325-2000/1	580	33.	0000-1030/9	1.3
13.	2200-1030/2	38	34.	1030-1800/9	6
14.	1855-2400/2	8	35.	1800-2000/9	1.3
15.	2400-1020/3	30	36.	2000-2230/9	1.1
16.	1020-1610/3	31	37.	2230-0800/10	35
17.	1610-2125/3	38	38.	0800-1200/10	87
18.	2125-0010/3	1.5			
19.	0010-0930/4	65			

TABLE 1. Atmospheric ice nucleus concentrations over the period July 30 through August 10, 1975 as measured by the membrane filter technique during the 1975 HAYES Fog Cruise.

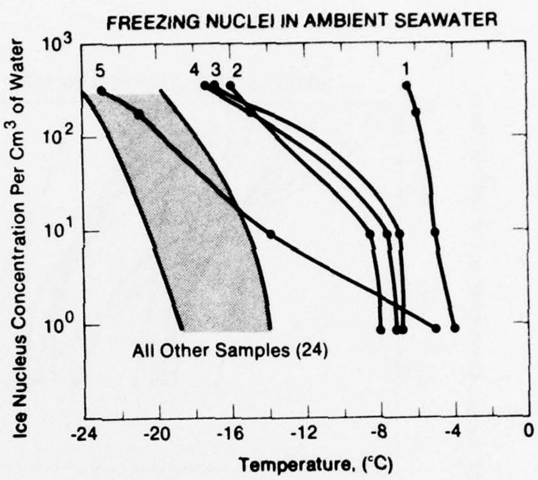

Figure 1. Freezing nucleus spectra of seawater samples tested onboard the USNS HAYES. Collection times for the numbered samples are: 1) 0900/8/8, 2) 1900/28/7, 3) 2000/1/8, 4) 2400/2/8, 5) 2300/4/8. All other samples exhibited ice nucleation activity beginning at temperatures lower than -14C and fell within the shaded portion of the figure.

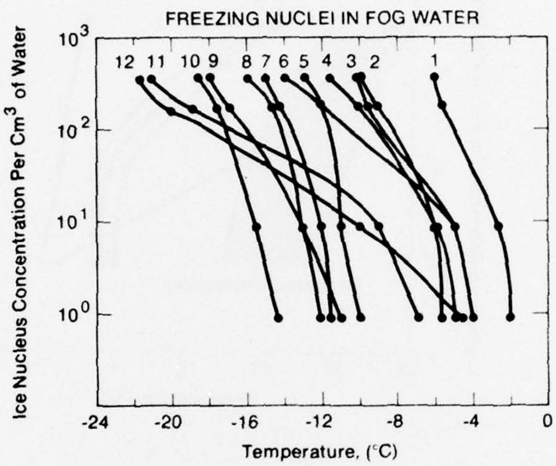

Figure 2. Freezing nucleus spectra of fog water samples tested onboard the USNS HAYES. Collection times for the samples are:
1) 0845/8/8, 2) 0600/6/8, 3) 0930/6/8, 4) 0700/6/8,
5) 1800/9/8, 6) 1000/6/8, 7) 2400/2/8, 8) 1000/31/7,
9) 1730/3/8, 10) 1030/31/7, 11) 1900/4/8, 12) 1830/7/8.

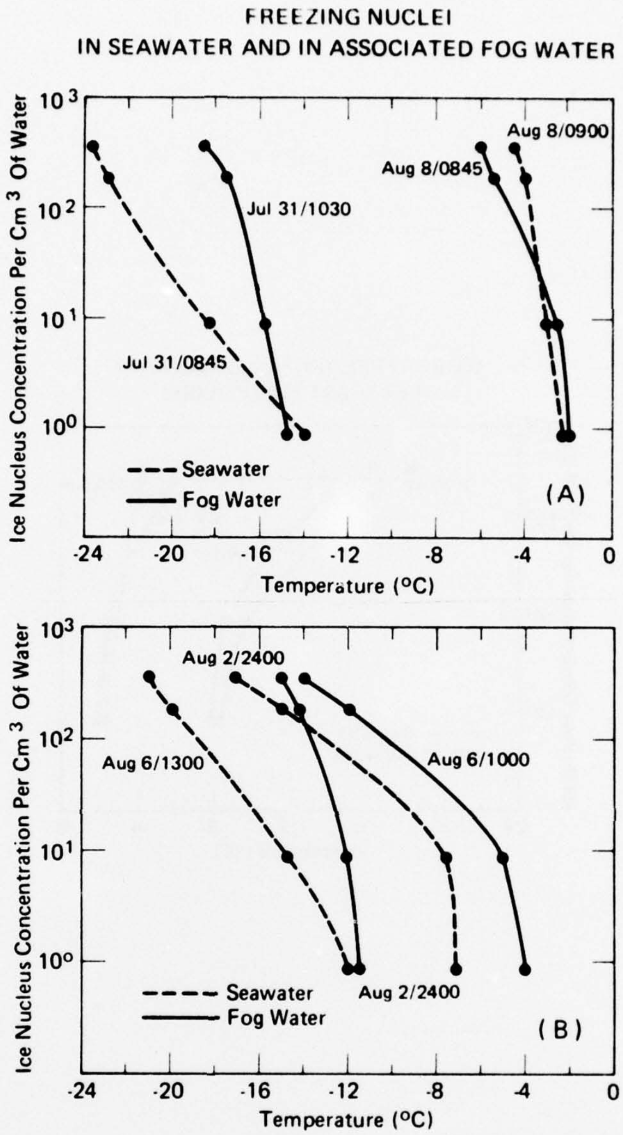

Figure 3. Relationships between freezing nuclei in seawater and associated fog waters Graph A shows cases where seawater and fogwater spectra are similar and Graph B shows cases where spectra are opposites. The seawater spectra shown in this figure have been corrected for a 2C melting point depression.

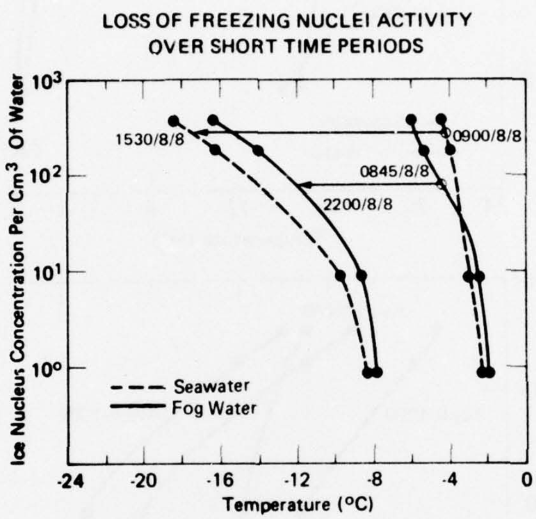

Figure 4. Freezing nucleus activity losses observed in ODN and FDN samples stored at ambient ship temperature. The seawater samples have been corrected for a 2C melting point depression.

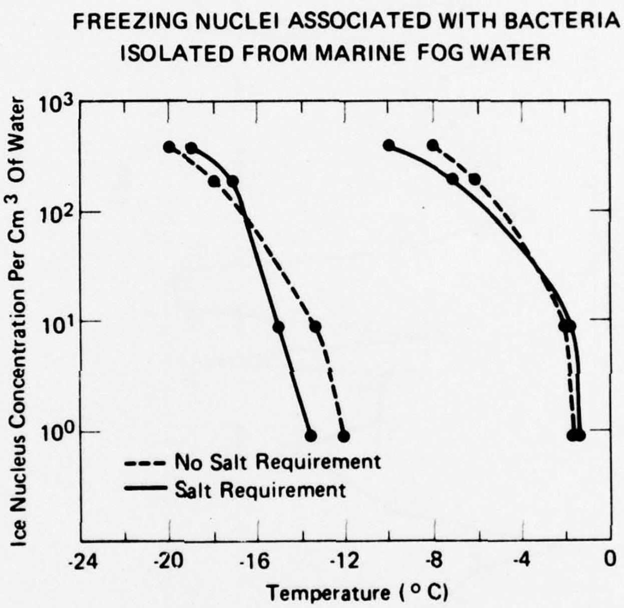

Figure 5. Freezing nucleus activity produced by bacteria isolated from marine fog water and grown on nutrient agar.

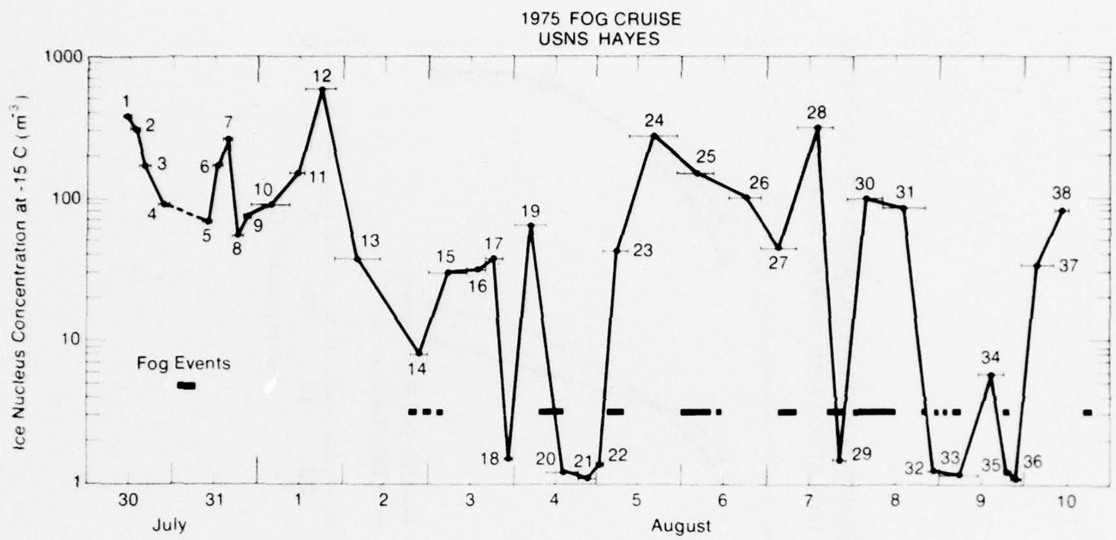

Figure 6. Atmospheric ice nucleus concentrations over the period July 30 through August 10 as measured by the membrane filter technique. The ice nucleus concentrations are plotted at the middle of the time period over which the filters were exposed. All filters were processed at -15C and water saturation. Fog event times were taken from Stuart Gathman's log.

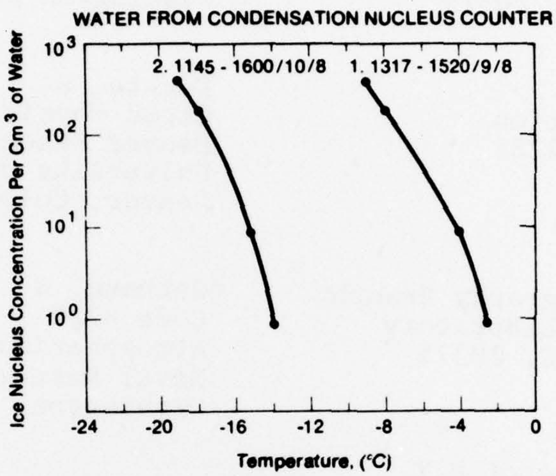

Figure 7. Freezing nucleus spectra of cloud water collected from the Denver Research Institute cloud chamber operated onboard the USNS HAYES. Sample 1 contained high concentrations of biological material whereas sample 2 contained low concentrations as tested by the Calspan infrared reflectance system operated by Bob Baier.

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